G025/G027
SERVICE MANUAL

⚠IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the machine and peripherals, make sure that the machine power cord is unplugged.
2. The wall outlet should be near the machine and easily accessible.
3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
4. If the print job process is started (the PC Interface LED lit) before the machine completes the warm-up or initialising period, keep hands away from the mechanical and electrical components because the machine starts making prints as soon as the warm-up period is completed.
5. The inside and the metal parts of the fusing unit become extremely hot while the printer is operating. Be careful to avoid touching those components with your bare hands.

HEALTH SAFETY CONDITIONS

1. Toner is non-toxic, but if you get it in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate toner cassette. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner cassette in accordance with local regulations. (It is non-toxic supply.)
3. Dispose of replaced parts in accordance with local regulations.

LASER SAFETY

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

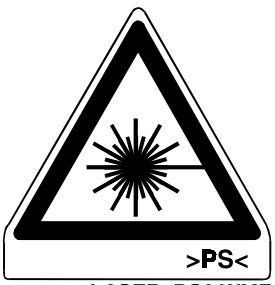
⚠WARNING

Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

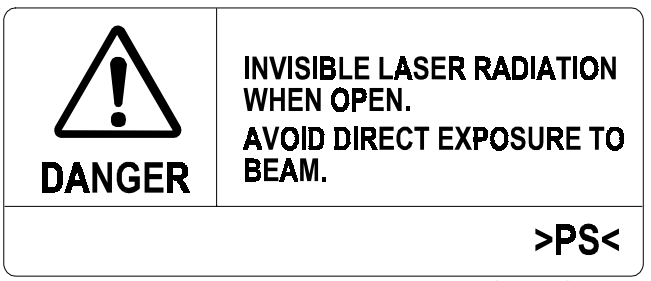
⚠WARNING

This machine contains a laser beam generator. Laser beams can cause permanent eye damage. Do not open the laser unit or look along the laser beam path while the main power is on.

CAUTION MARKINGS:



LASER_PS1.WMF



LASER_PS4.WMF

LASER_PS4.WMF

⚠WARNING

The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacture's instructions.

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General Notice:
Other product names used herein are for identification purpose only and may be trademarks of their respective companies. We disclaim any and all rights in those marks.

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OPTION

PAPER FEED UNIT (G512)

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1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Type	Multi-functional Product G025: ADF Scanner, Fax, Copier, PC Printer G027: ADF/Flatbed Scanner, Fax, Copier, PC Printer
Circuit	PSTN, PABX
Connection (G025/G027)	Direct Couple
Document Size	Flatbed Scanner Width: Within 216 mm [8.5"] Length: Within 355.6 mm [14"] ADF Width: 91 mm - 216 mm [3.6" - 8.5"] Length: 140 mm - 355.6 mm [5.5" - 14"] Up to 1200 mm [47.2”], manually assisted
Document Weight (ADF)	Equivalent to 60 g/m² - 90 g/m² (0.05 mm to 0.2 mm)
Document Feed (ADF)	Face down
ADF Capacity	10 sheets
Scanning Method	CCD unit (including LED array)
Scan Resolution	Copy mode: Main scan: 300 dpi Sub-scan: 150 – 600 dpi (Depends on reduction/enlargement ratio) Scanner Mode Main scan: 300 dpi Sub-scan: 300 dpi Fax mode Main scan: 8 dots/mm Sub-scan: Standard - 3.85 lines/mm Detail - 7.7 lines/mm
Memory Capacity	ECM: 64 KB; single buffer
Protocol	Group 3 with ECM
Compression	MH, MR, MMR

Modulation	V17 (TCM), V29 (QAM), V27ter (PHM), V21 (FM)
Data Rate	14400/12000/9600/7200/4800/2400 Automatic fall-back
I/O Rate	With ECM: 0 ms/line Without ECM: 5, 10, 20 or 40 ms/line
Transmission Time	ADF mode: 8 seconds Flatbed mode: 12 seconds Condition: 14400 bps; G3 ECM, MMR and MTF off for an ITU-T #1 test document using standard resolution
Printing System	Laser printing, plain paper, dry toner
Printing Speed	Printer: 6 ppm Copier: 6 cpm (Memory copy mode)
Paper Size	Upper Paper Tray Width: 91 mm - 216 mm [3.6" - 8.5"] Length: 140 mm - 355.6 mm [5.5" - 14"] Lower Paper Tray (Option) A4, 8½" x 11"
Paper Capacity	Upper Paper Tray: 100 sheets (Plain paper) Lower Paper Tray (Option): 250 sheets (Plain paper)
Printer Resolution	600 dpi x 600 dpi (Enhanced 1200 dpi x 600 dpi with smoothing in the PC print mode)
Printer Compatibility	PDL: PCL5e Compatible PC: PC/AT Compatible OS: Windows 3.x, 95, 98
Scanner Compatibility	Twain Interface Compatible PC: PC/AT Compatible OS: Windows 95, 98
Interface	Interface: IEEE-1284 Bi-Centronics Interface ECP
Power Supply	AC 120 V 60 Hz AC 220 V – 240 V 50 Hz/60 Hz
Power Consumption (Average)	G025 (without optional paper feed unit): Power saver mode: 220 V: 14 W 240 V: 15 W

Stand-by:
220 V: 51 W 240 V: 52 W
Printing:
220 V: 222 W 240 V: 221 W
Copying:
220 V: 223 W 240 V: 220 W
Fax transmitting:
220 V: 67 W 240 V: 67 W
Fax receiving:
220 V: 188 W 240 V: 197 W
Scanning:
220 V: 63 W 240 V: 63 W

G027 (without optional paper feed unit):
Power saver mode:
120 V: 14 W 220 V: 15 W 240 V: 15 W
Stand-by:
120 V: 69 W 220 V: 61 W 240 V: 62 W
Printing:
120 V: 263 W 220 V: 232 W 240 V: 229 W
Copying (ADF mode):
120 V: 252 W 220 V: 253 W 240 V: 249 W
Fax transmitting (ADF mode):
120 V: 77W 220 V: 64 W 240 V: 68 W
Fax receiving:
120V: 230 W 230 V: 229 W 240 V: 231 W
Scanning (Flatbed mode):
120 V: 68 W 220 V: 61 W 240 V: 64 W

Operating Environment	Temperature: 10ºC - 35ºC [50ºF - 95ºF] Humidity: 15% - 80%
Recommended Environment	Temperature: 15ºC - 25ºC [59ºF - 77ºF] Humidity: 30% - 70%
Dimensions (W x D x H)	Main Unit: G025: 337mm x 333mm x 292mm (13.3" x 13.1" x 11.5") G027: 352 mm x 576 mm x 297 mm (13.9" x 22.7" x 11.7") (Excluding trays and optional unit) Optional Paper Feed Unit 332 mm x 523 mm x 79 mm (13.1" x 20.6" x 3.1")
Weight	G025: 9.5kg [20.9 lb.] G027: 15.5kg [34.1 lb.] (Including toner cassette) Optional Paper Feed Unit 2.8 kg [6.2 lb.]

1.2 FEATURES

Equipment

Features	G025	G027
ADF	✓	✓
Flatbed Scanner	-	✓
Paper Feed Unit	Option	Option
Software Counter	✓	✓
Parallel Interface	✓	✓
Second Printer Interface	✓	✓

Video Processing Features

Features	G025	G027
Auto Image Density Control	✓	✓
Halftone (Dithering & Error diffusion)	✓	✓
Resolution	✓	✓
Smoothing	✓	✓

Copier Features

Features	G025	G027
Auto Image Density	✓	✓
Photo Mode	✓	✓
Reduction/Enlargement	✓	✓
Zoom	✓	✓
Electronic Sorting	✓	✓
Multi-copy Mode (Up to 99)	✓	✓
Memory Copy	✓	✓

PC Scanner Features

Features	G025	G027
PC scanner	✓	✓

Communication Features - Auto

Features	G025	G027
Automatic Fallback	✓	✓
Automatic Redialing (ADF mode only)	✓	✓
Limited Substitute Reception	✓	✓
Page Separation Mark	✓	✓

Communication Features - User Selectable

Features	G025	G027
Authorized Reception	✓	✓
Auto Dialing (pulse or DTMF)	✓	✓
Auto Image Density Selection	✓	✓
Direct Fax Number Entry	✓	✓
Immediate Redialing	✓	✓
Immediate Transmission	✓	✓
Name Dial (25 stations)	✓	✓
On Hook Dial	✓	✓
Quick Dial (5 stations)	✓	✓
Reception Modes (Fax, Tel)	✓	✓
Remote Control Features (Tel→ Fax)	✓	✓
Tonal Signal Transmission	✓	✓

Communication Features - Service Selectable

Features	G025	G027
Busy Tone Detection	✓	✓
ECM	✓	✓

Other User Features

Features	G025	G027
Language Selection	✓	✓
Multi-copy Mode (up to 99)	✓	✓
Power Saver Mode (standby mode)	✓	✓
Toner Saving Mode	✓	✓
User Parameters	✓	✓
Clock	✓	✓
Daylight Saving Time	✓	✓
RDS on/off	✓	✓
Remaining memory indicator	✓	✓
TTI, CSI (RTI is not available)	✓	✓
Telephone line type	✓	✓
TTI on/off	✓	✓

Reports - Automatic

Features	G025	G027
Error Report	✓	✓
Journal	✓	✓
Power Failure Report	✓	✓
Transmission Result Report	✓	✓
Unauthorized Call Report	✓	✓

Report - User-initiated

Features	G025	G027
Help List	✓	✓
Journal	✓	✓
Dial List	✓	✓

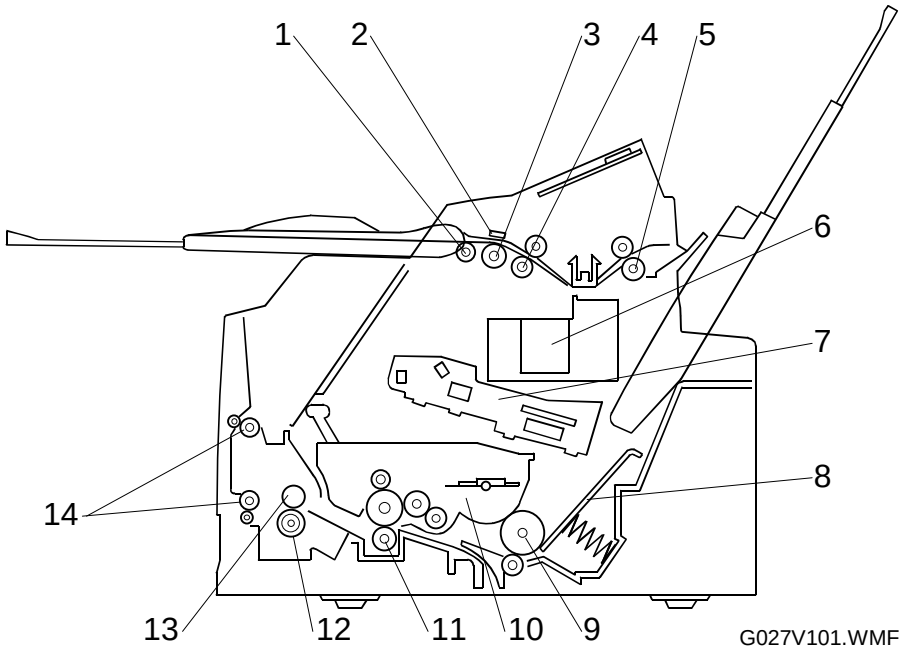
Service Mode Features

Features	G025	G027
Bit switch programming	✓	✓
Speaker test	✓	✓
Cable Equalizer	✓	✓
Country code	✓	✓
DTMF tone test	✓	✓
Modem test	✓	✓
Operation panel test	✓	✓
RAM display/rewrite	✓	✓
RAM dump	✓	✓
RAM test	✓	✓
Software updating	✓	✓
System parameter list	✓	✓

1.3 COMPONENT LAYOUT

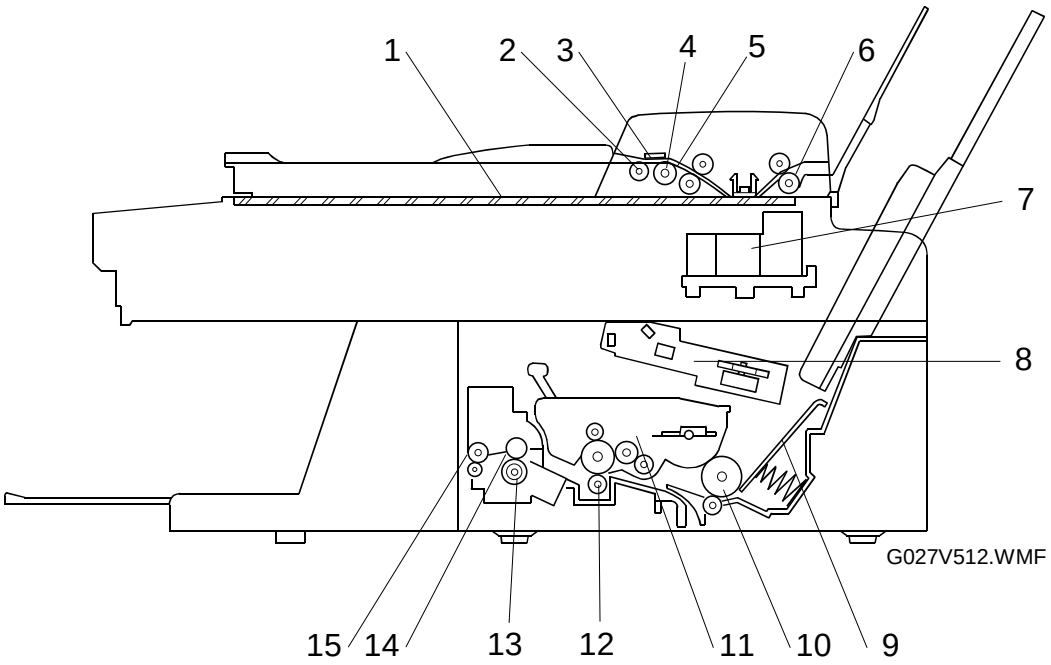
1.3.1 MECHANICAL COMPONENTS

G025



No.	Name	Description
1	Pick-up Roller	Picks up pages of the document from the document table one at a time.
2	Separation Tab	Prevents more than one sheet from feeding into the scanner.
3	Document Feed Roller	Feeds the document to the document feed-in roller.
4	Document Feed-in Roller	Feeds the document through the scanning area.
5	Document Feed-out Roller	Feeds the document out from the scanning area.
6	CCD Unit	Contains the CCD and LED array.
7	Laser Unit	Consists of the laser diode unit, cylindrical lens, f-theta lens, polygon mirror motor, and other laser optical components.
8	Upper Tray Bottom Plate	Presses paper stacked in the upper paper tray against the paper feed roller.
9	Paper Feed Roller	Picks up the top sheet of paper from the stack in the upper paper tray and feeds it into the transfer area.
10	Toner Cassette	Consists of the OPC drum, toner, toner application roller, development roller, charge brush roller, cleaning blade, and other development components.
11	Transfer Roller	Applies a charge to the paper to pull the toner off the drum and onto the copy paper.
12	Pressure Roller	Applies pressure to the paper during fusing.
13	Hot Roller	Fuses the toner to the copy paper.
14	Paper Exit Roller	Feeds the paper out of the printer.

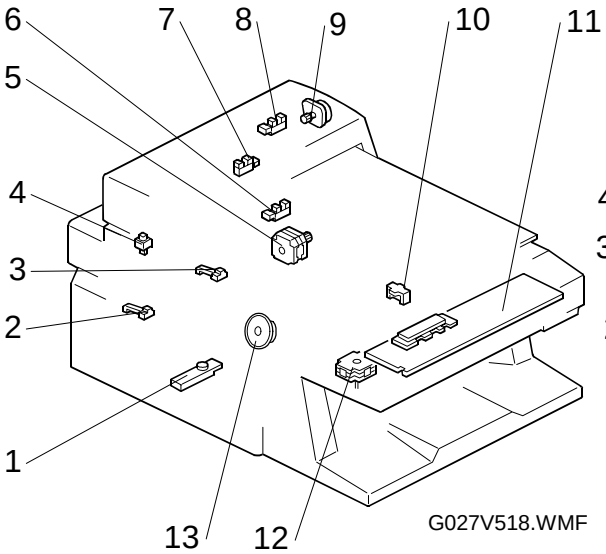
G027 model



No.	Name	Description
1	Exposure Glass	The original is placed here for scanning.
2	Pick-up Roller	Picks up pages of the document from the document table one at a time.
3	Separation Tab	Prevents more than one sheet from feeding into the scanner.
4	Document Feed Roller	Feeds the document to the document feed-in roller.
5	Document Feed-in Roller	Feeds the document through the scanning area.
6	Document Feed-out Roller	Feeds the document out from the scanning area.
7	CCD Unit	Contains the CCD and LED array.
8	Laser Unit	Consists of the laser diode unit, cylindrical lens, f-theta lens, polygon mirror motor, and other laser optical components.
9	Upper Tray Bottom Plate	Presses paper stacked in the upper paper tray against the paper feed roller.
10	Paper Feed Roller	Picks up the top sheet of paper from the stack in the upper paper tray and feeds it into the transfer area.
11	Toner Cassette	Consists of the OPC drum, toner, toner application roller, development roller, charge brush roller, cleaning blade, and other development components.
12	Transfer Roller	Applies a charge to the paper to pull the toner off the drum and onto the copy paper.
13	Pressure Roller	Applies pressure to the paper during fusing.
14	Hot Roller	Fuses the toner to the copy paper.
15	Paper Exit Roller	Feeds the paper out of the printer.

1.3.2 ELECTRICAL COMPONENTS

G027 model



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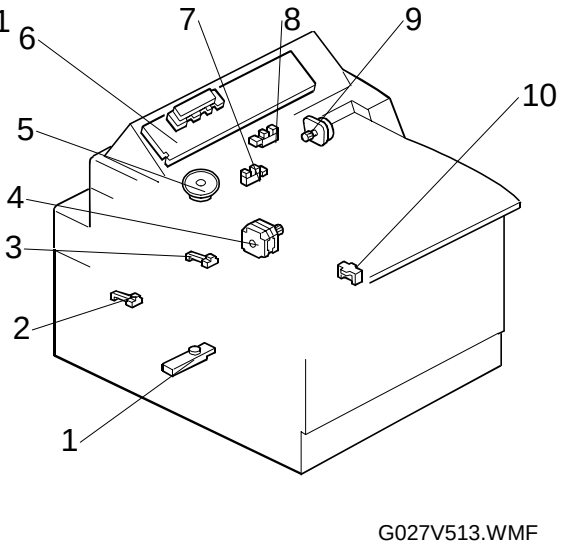
G025 model



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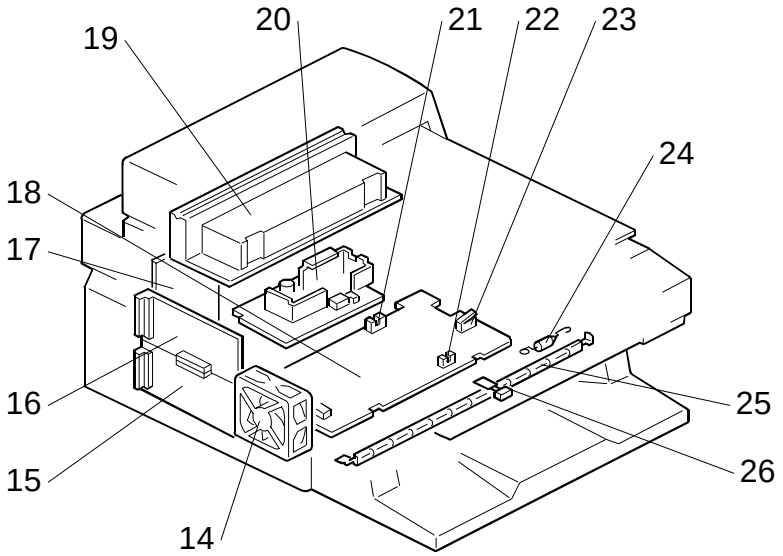
G027	G025	Name	Description
1	1	Toner End Sensor	This detects when the toner has run out.
2	2	Paper Width Sensor	This detects whether the paper in the upper paper tray is wider than 203 millimeters or not.
3	3	Paper End Sensor	This detects when the paper in the upper paper tray has run out.
4	-	Platen Cover Switch	This detects when the platen cover is opened.
5	4	Main Motor	This DC motor drives the toner cassette, paper feed mechanism, and fusing unit.
6	-	Home Position Sensor	This detects when the CCD unit is at the home position.
7	7	Document Sensor	This detects the presence of a document in the feeder.
8	8	ADF Registration Sensor	This detects the leading and trailing edges of originals, and checks for jams.
9	9	ADF Motor	This stepper motor drives the ADF mechanism.
10	10	Paper Pick-up Solenoid	This releases the cam stopper to pick up a sheet of paper.
11	6	Operation Panel	This board controls the operation panel.
12	-	Scanner Motor	This stepper motor drives the book scanner.
13	5	Monitor Speaker	Allows the user to hear dial tone and the key-touch tone.

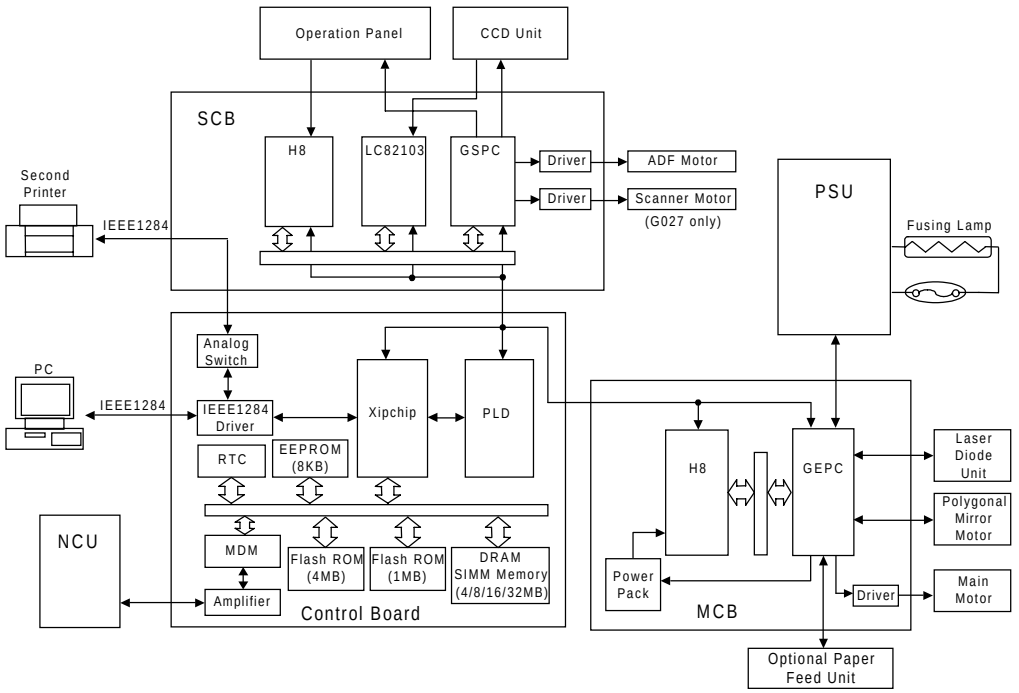
G027 model (G025 model parts are in the same location as G027)



G027V519.WMF

No.	Name	Description
14	Fan Motor	Blows hot air out of the machine.
15	Control Board	Controls the machine.
16	Scanner Control Board (SCB)	Controls the scanner components.
17	Network Control Board (NCU)	Contains relays and switches to interface the machine with the network and the handset.
18	Mechanical Control Board (MCB)	Controls the printer components.
19	CCD Unit	Includes the CCD and LED array. The CCD reads and converts the light reflected from the document into an analog video signal. The LED array illuminates the document.
20	Power Supply Unit (PSU)	Supplies power to the machine.
21	Paper Registration Sensor	Detects when leading edge of the copy paper reaches the registration area.
22	Paper Exit Sensor	Detects when paper is fed out of the fusing unit
23	Interlock Switch	If the upper cover is open, this interlock switch cuts the +5VLD power supply for the laser diode and the +24V power supply for the fan motor, polygonal mirror motor, main motor, and other components.
24	Thermofuse	Interrupts the AC power supply to the fusing lamp if the temperature of the thermostat surface exceeds 250°C.
25	Fusing Lamp	Fuses the toner to the paper.
26	Thermistor	Monitors the temperature inside the fusing unit.

1.4 OVERALL MACHINE CONTROL



G027V514.WMF

This machine contains a control board, mechanical control board (MCB), scanner control board (SCB), network control board (NCU), and power supply unit (PSU).

The control board controls the system and interfaces with the SCB, MCB, and the PC.

The control board also contains a modem chip and controls the network control board (NCU).

The MCB controls devices related to the printer port, and the optional paper feed unit. It also has an onboard power pack that generates high voltage supplies necessary for the printing process.

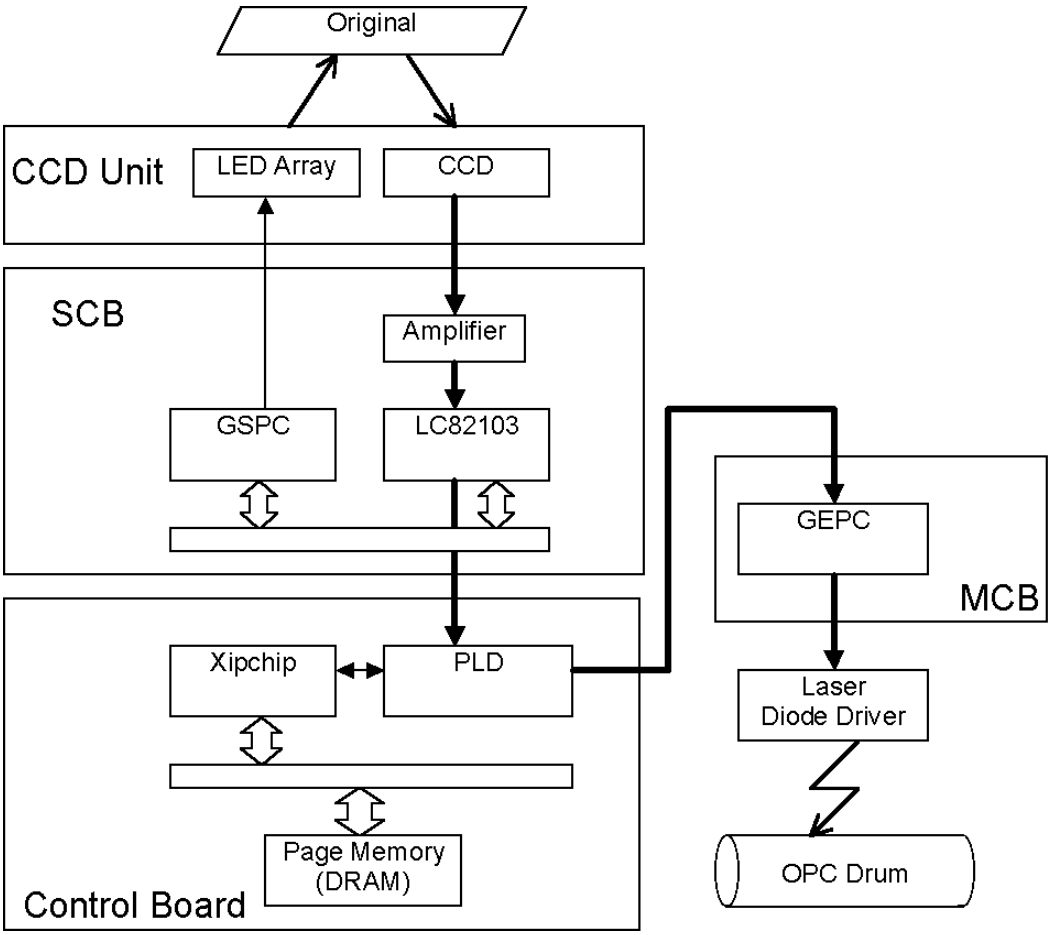
The SCB controls devices related to the scanner.

The NCU contains relays and switches to interface the machine with the network and the handset.

The PSU generates constant +24, +5 and -5 DC voltages and supplies them to the boards. It also supplies AC power to the fusing lamp.

1.5 VIDEO DATA PATH

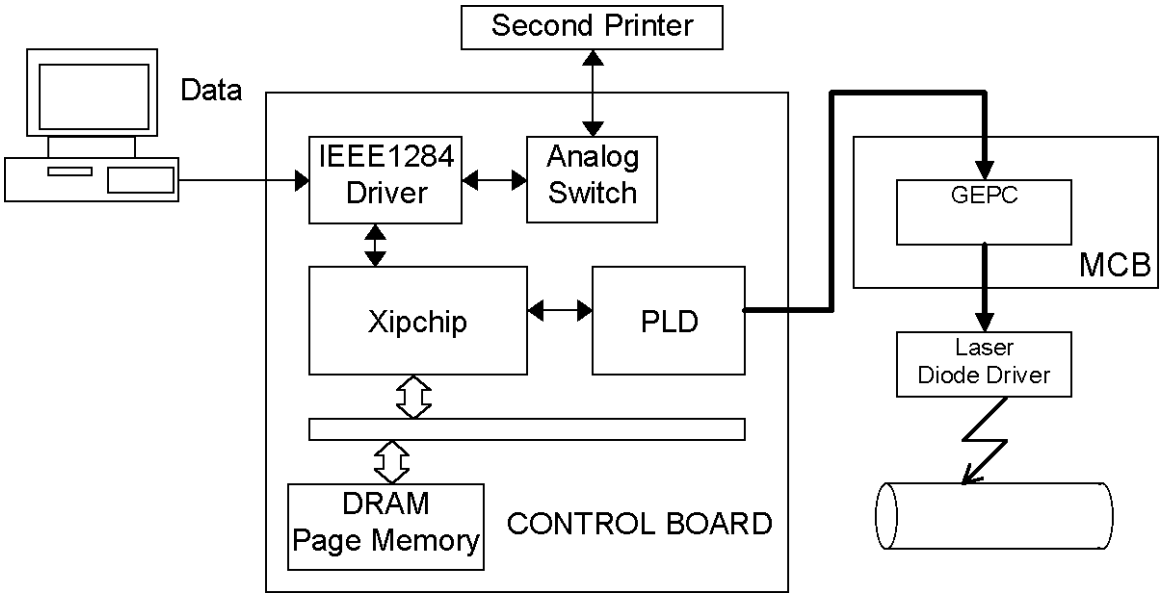
1.5.1 COPYING



G027V510.WMF

The CCD generates an analog video signal from the light reflected from the original.
The scanned data passes to the scanner control board (SCB). The SCB converts scanned video data from the analog signal to a digital signal. Then the data passes to the control board. The control board does digital video data processing, such as halftone (dither/error diffusion), reduction/enlargement, and smoothing. Then it stores the processed data in the page memory. The processed data passes to the mechanical control board (MCB). The MCB drives the laser diode based on the processed data signal. Then, the laser beam writes a latent image on the drum.

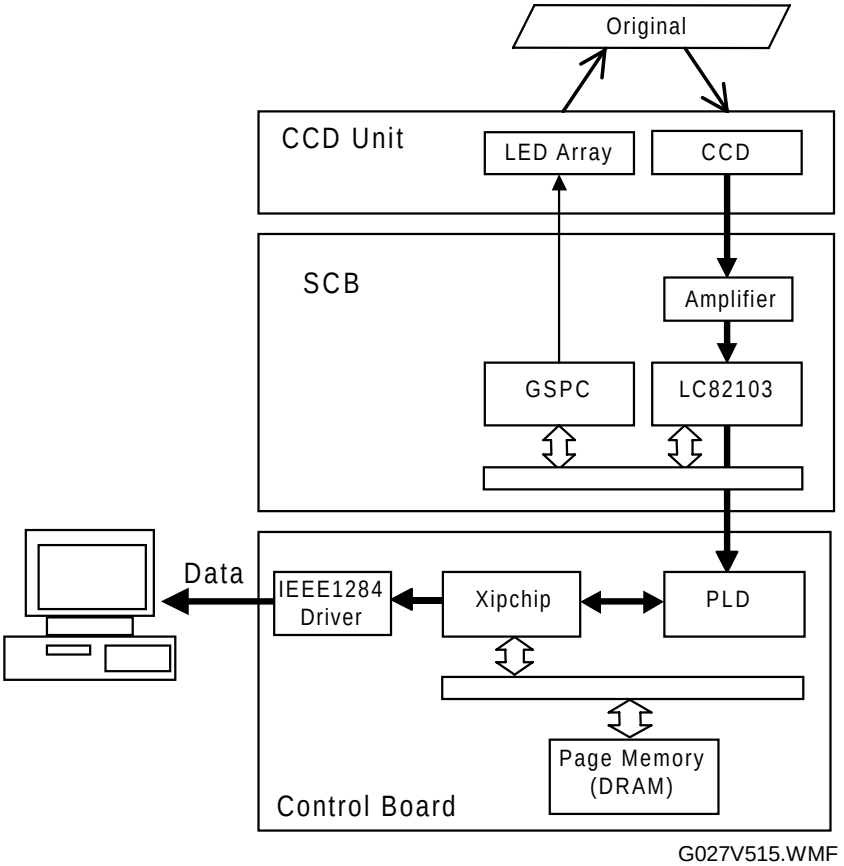
1.5.2 PC PRINTING



G027V511.WMF

Data from the PC passes to the control board through the IEEE1284 driver. If the analog switch is changed over the second printer by pressing the second printer key on the operation panel, the video data passes to the second printer.
The control board does digital video data processing such as halftone (dither/error diffusion), reduction/enlargement, and smoothing. Then it stores the processed data in the page memory. The processed data passes to the mechanical control board (MCB).
The MCB drives laser diode based on the processed data signal. Then, the laser beam writes a latent image on the drum.

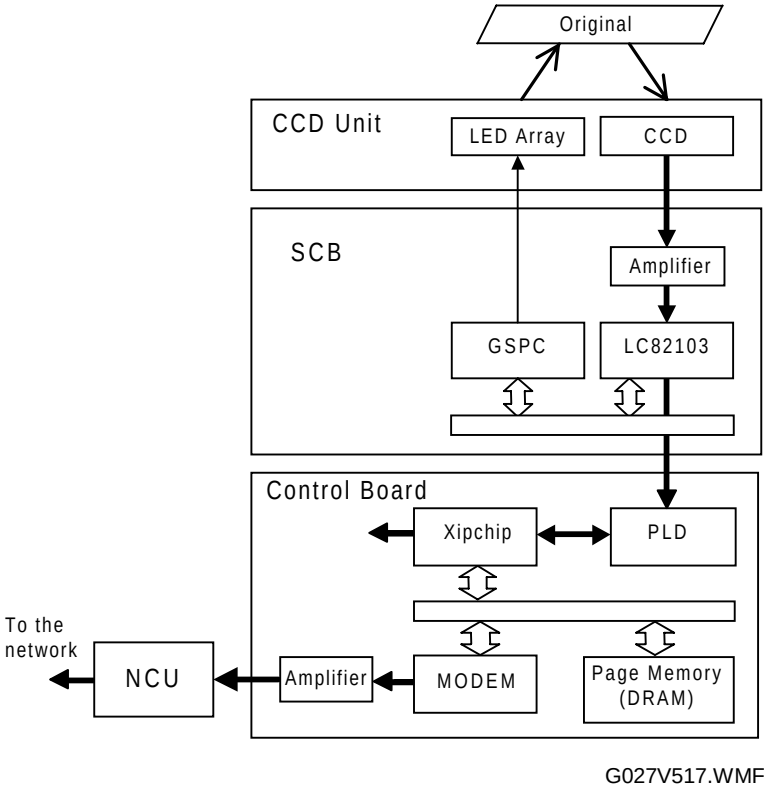
1.5.3 PC SCANNING



G027V515.WMF

The CCD generates an analog video signal from the light reflected from the original.
The scanned data passes to the scanner control board (SCB). The SCB converts scanned video data from the analog to digital signals. Then the data passes to the control board. The control board does digital video data processing, such as halftone (dither/error diffusion), reduction/enlargement, and smoothing. Then it stores the processed data in the page memory. The processed data passes to the PC through the IEEE1284 (parallel port) driver.

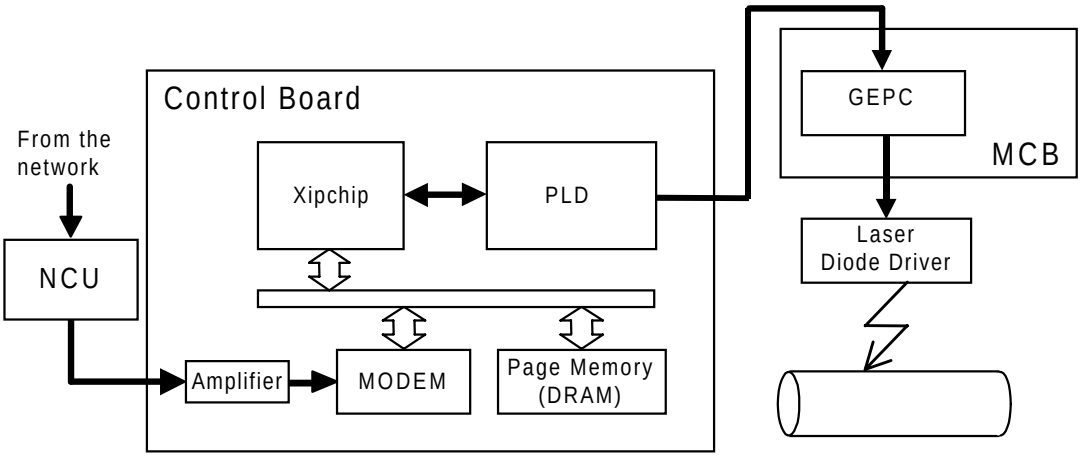
1.5.4 TRANSMISSION



G027V517.WMF

Scanned data from the CCD passes to the SCB, after analog/digital processing. Then the Xipchip in the control board compresses the data for transmission. The compressed data then passes to the DRAM that works as the ECM memory before entering the telephone line through the modem.

1.5.5 RECEPTION



RECEPTION.WMF

Data from the line passes to the modem through the network control board (NCU) and amplifier. After the modem demodulates the data, it passes through the DRAM that works as the ECM memory to the Xipchip, which decompresses it into raster image data. The raster image data then passes to the page memory for printing. After a page of data has been stored in the page memory, it is sent to the mechanical control board (MCB).
The MCB sends the control signal to the laser diode driver. Then, the laser beam writes a latent image on the drum.

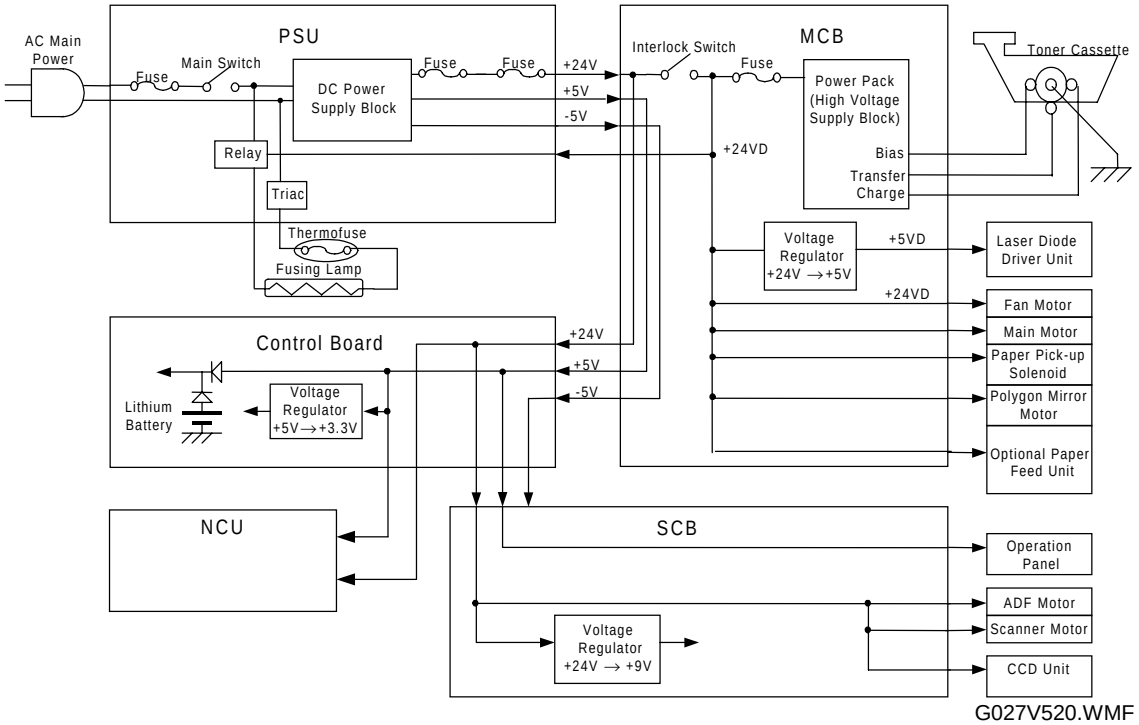
Limited substitute reception

If one of the following problems occurs during reception, the machine cannot print the incoming message. After sending MCF, the received page is held in the page memory until the problem is fixed. Then, the stored data is sent to the MCB as print data. Until the problem is fixed, incoming calls are ignored, so only one message can be stored using this feature.

- Paper end
- Paper jam
- Cover open
- Toner end

With the substitute reception normally found in other fax machines, incoming calls are accepted until the memory fills up.

1.6 POWER DISTRIBUTION



G027V520.WMF

The power supply unit (PSU) generates +24 volts, +5 volts, and -5 volt DC power supplies, and they are supplied to the mechanical control board (MCB), control board, network control board (NCU), and scanner control board (SCB). The MCB generates +5 volts from the +24 volts for the laser diode driver, and it also generates high voltage power for development bias, charge voltage, and transfer voltage. The control board generates +3.3 volts from the +5 volts supply, which is used internally. The scanner control board (SCB) generates +9 volts from the +24 volt supply, which is used internally.

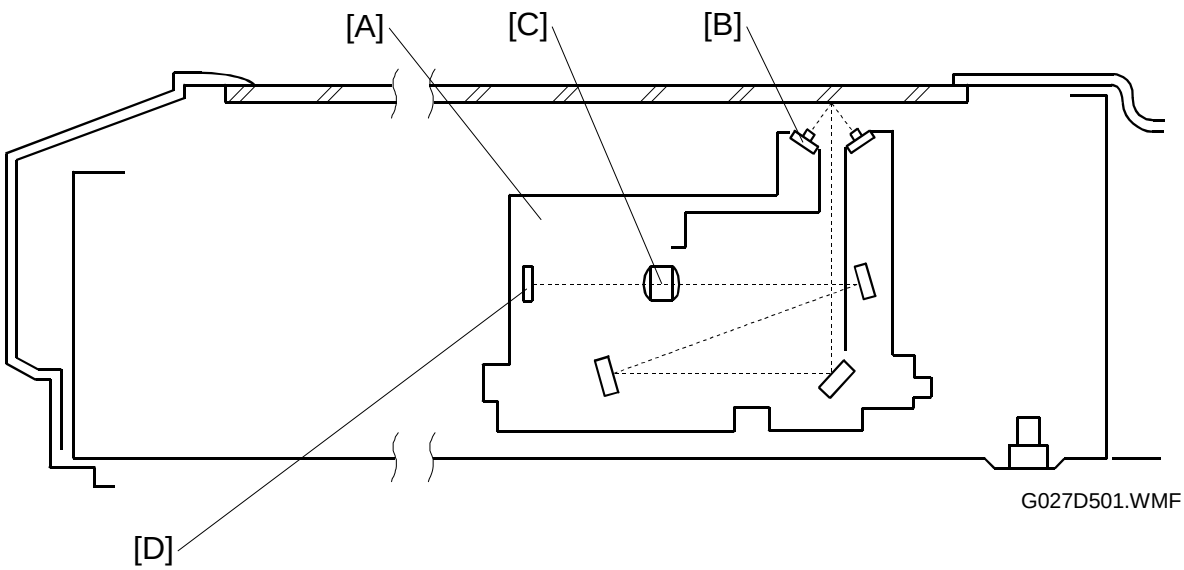
The MCB contains an interlock switch, which opens when the upper cover is opened. If this switch is opened, the +24 volt DC power is cut and the power to the following devices is shut off.

- Power pack
- Main, fan and polygon mirror motors
- Laser diode driver
- Fusing lamp
- Paper pick-up solenoid
- Optional paper feed unit

2. DETAILED SECTION DESCRIPTIONS

2.1 SCANNING

2.1.1 OVERVIEW (G027 ONLY)

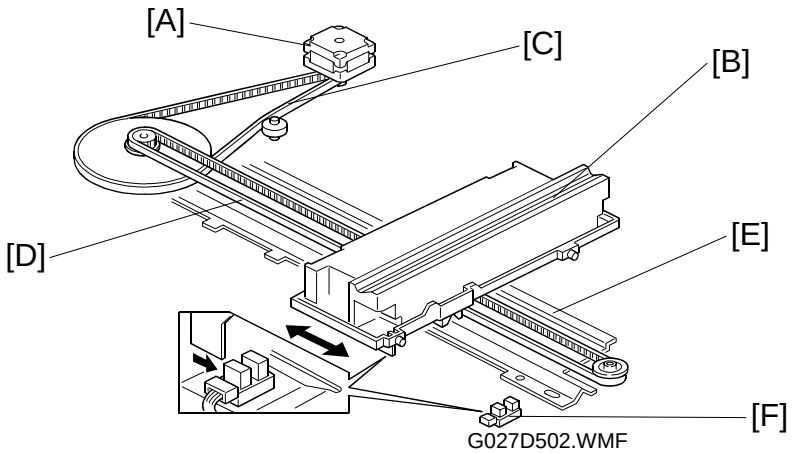


The CCD unit [A] consists of a LED array [B], three mirrors, a lens [C], and a CCD [D].

During a copy cycle, the light from the LED array is reflected off the original, and then is transferred onto the CCD via the mirrors and the lens.

The CCD unit moves under the exposure glass to scan a book original. When scanning a sheet original using the ADF, it remains at the ADF scanning position.

2.1.2 CCD UNIT DRIVE (G027 ONLY)

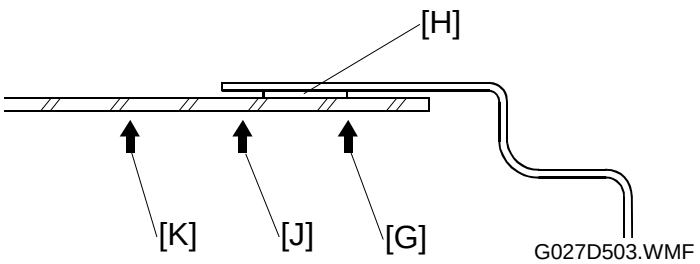


A stepper motor [A] drives the CCD unit [B]. The motor uses the timing belt [C] and the drive belt [D] to move the CCD along the guide rail [E].

The home position sensor [F] detects when the CCD unit is in the home position.

The motor speed depends on the selected reduction or enlargement ratio.

When the machine is turned on, it checks the home position sensor. If the home position sensor is on, the CCD unit is in the home position. If the home position sensor is off, the machine moves the CCD unit until the home position sensor turns on.



Before scanning or copying, the CCD unit moves from the home position [G] to the left until the home position sensor turns off. Then it moves in the opposite direction until the home position sensor turns back on, completing home position registration. After that, the CCD unit moves from the home position to a position under the white shading strip [H] to adjust shading. At that time, the LED array is turned on.

Book Scanning

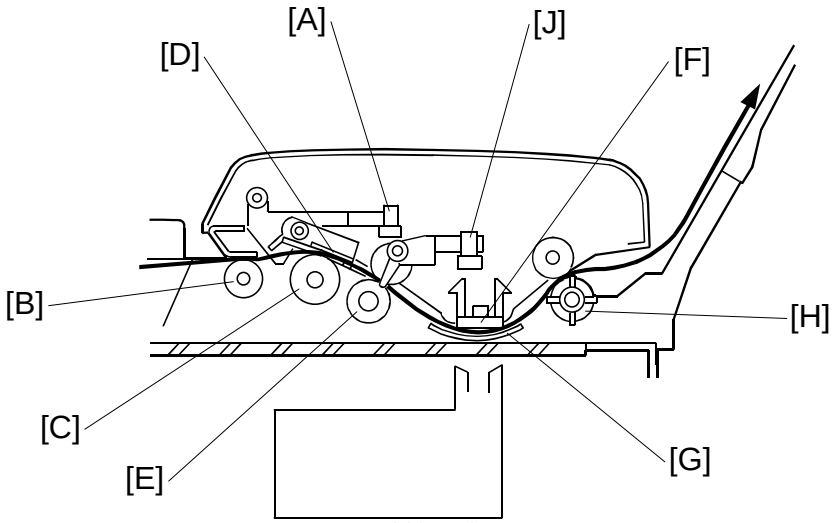
After shading, the CCD unit stops temporarily at the reading stand-by position [J] while the scan parameters (X/Y coordinates) are initialized. Then, it scans across the original. Scanning speed depends on the reproduction ratio. Full size (100%) scanning speed is 37.6 mm/s. Shading is done before scanning each page.

ADF Scanning

After shading, the scanner moves to the ADF scanning position [K] and stays there while documents are fed through the ADF. Shading is done only once before each job.

2.1.3 AUTO DOCUMENT FEEDER (ADF)

Overview



The ADF feeds from the bottom page of the document stack on the ADF table. During scanning, the page moves past the CCD unit, which is locked in position.

The document sensor [A] detects documents set on the table.

Before the start of scanning, the CCD unit moves to the ADF scanning position (G027 only).

The pick-up [B] and feed [C] rollers feed the document into the ADF unit. Only the bottom sheet is fed because the separation tab [D] prevents any other sheets from feeding. The document feed-in roller [E] feeds the document through the ADF unit. The feed speed depends on the reproduction ratio. For 100% copies, the feeding speed is 37.6 mm/s.

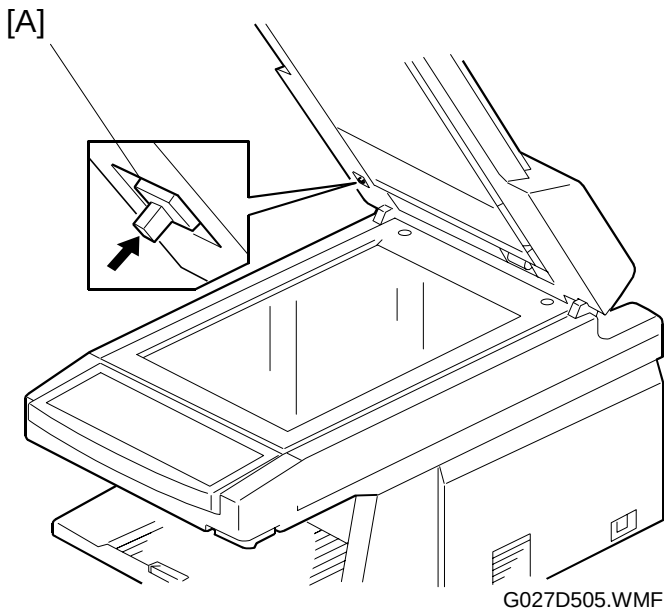
The pressure plate [F] presses the document against the exposure glass through the mylar guide [G] at the scan line, so that the document is within the CCD unit's range of focus.

After the document passes the scanning position, the feed-out roller [H] feeds it onto the document exit tray.

When scanning is finished, the CCD unit moves back from the ADF scanning position to the home position (G027 only).

The registration sensor [J] detects the leading edge and the trailing edge of the document, and checks for document jams.

Platen Cover switch (G027 only)



The platen cover switch [A] detects if the platen cover is opened or closed.

If a document is set on the ADF without first opening the platen cover after copying in the book scanner mode, “Original left” and “on glass” are displayed on the LCD alternately and the machine disables copying. When the platen cover is opened and closed, the machine enables copying.

Jam Conditions

Non-feed

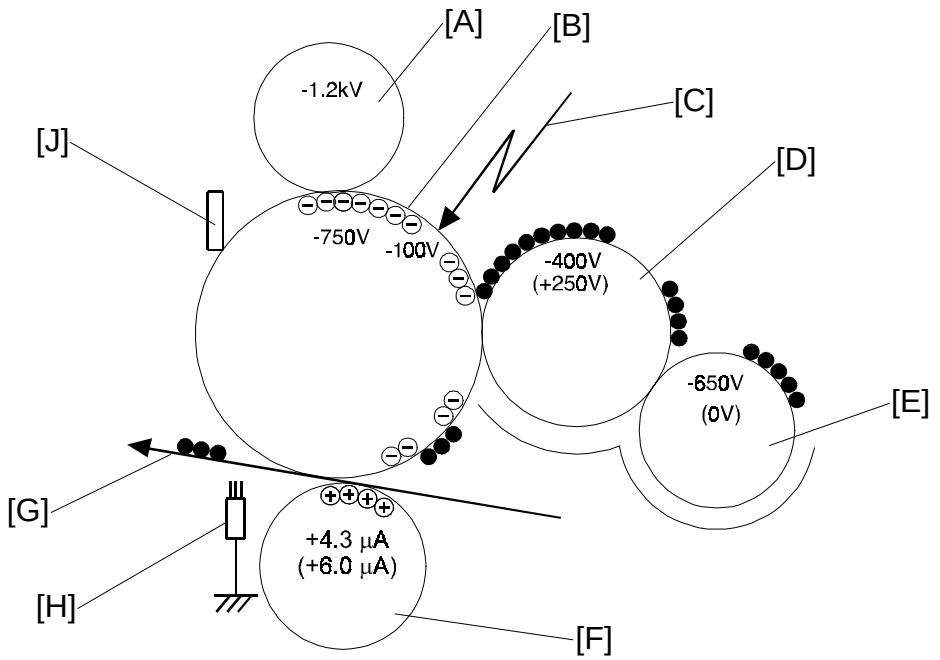
The ADF registration sensor does not turn on within 2 seconds after the ADF motor starts (Error Code 91).

Maximum document length exceeded

The ADF registration sensor does not turn off after the maximum document length (355.6 mm) has been fed since it turned on (Error Code 92).

2.2 PRINTING

2.2.1 PRINTING PROCESSES AROUND THE DRUM



G027D534.WMF

This machine uses a “write to black” system, using negative toner.

Charge: The charge brush roller [A] gives the OPC drum [B] surface a negative charge of -750 volts.

Exposure: A laser [C] writes a latent image on the drum. The area exposed by the laser beam drops to about -100 volts.

Development: The development roller [D] carries toner to the drum and develops the latent image on the drum surface.

Development bias (during printing):
- Toner application roller [E]: -650 volts
- Development roller [D]: -400 volts

Switching bias (At the start and the end of any print process):
- Toner application roller [E]: 0 volts
- Development roller [D]: +250 volts

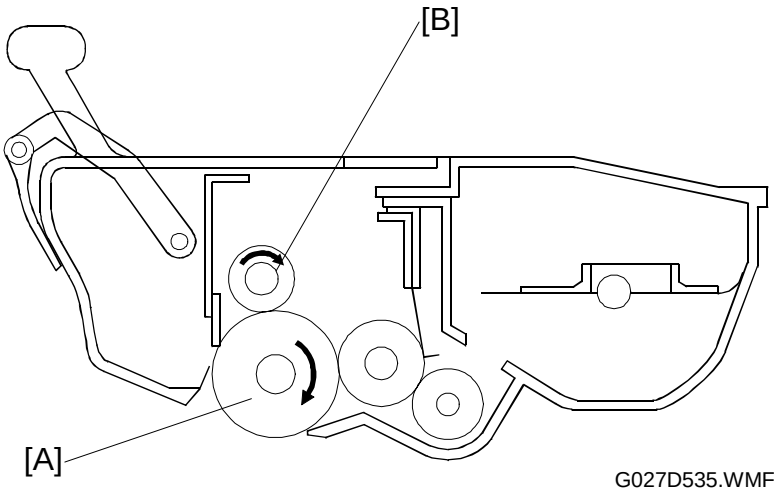
Image Transfer: The transfer roller [F] pulls the toner from the drum onto the paper [G]. A constant current of 4.3 μA (6.0 μA for envelopes) is applied.

Paper Separation: The antistatic brush [H] removes the charge on the underside of the paper to help the paper separate from the drum.

Drum Cleaning: The cleaning blade [J] removes any toner remaining on the drum after the image is transferred to paper.

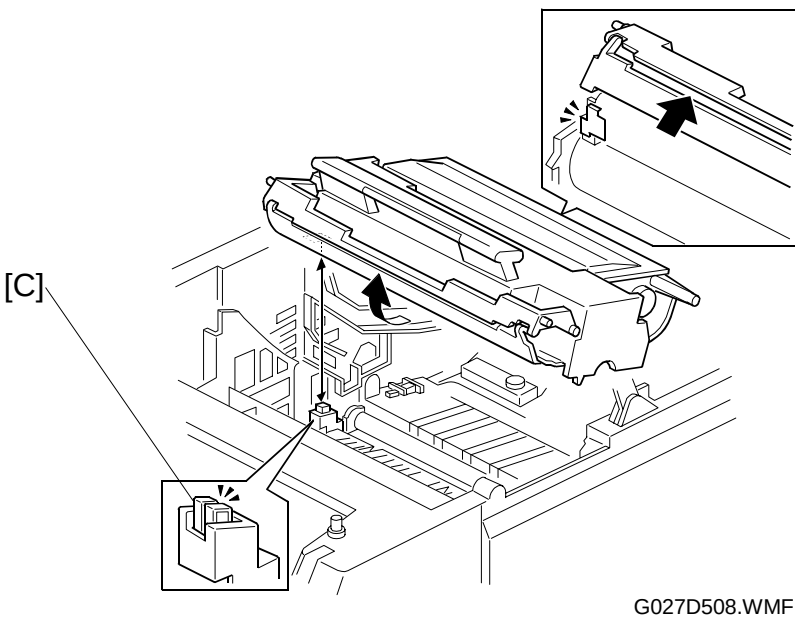
The high voltages are supplied from Mechanical Control Board.

2.2.2 CHARGE



The OPC (Organic Photoconductor) drum [A] used in this machine is small in diameter (24 mm). This allows a very compact design.

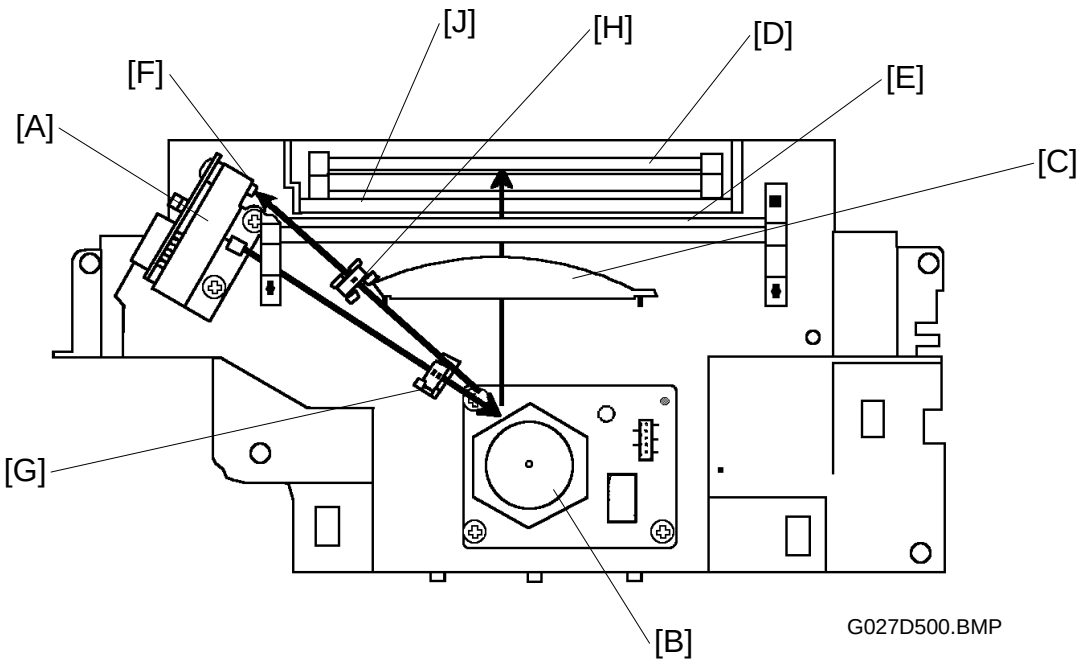
A charge brush roller [B] charges the photoconductor. The charge brush has the advantage of not generating ozone. A large negative voltage (-1.2 kV) is applied from mechanical control board to the charge brush roller. This charge brush roller gives the OPC drum surface a negative charge (-750 V). The diameter of the roller is 14 millimeters.



The voltage to the charge brush roller is supplied through the terminal [C] from Mechanical Control Board.

2.2.3 LASER EXPOSURE

Overview



Laser Unit Layout

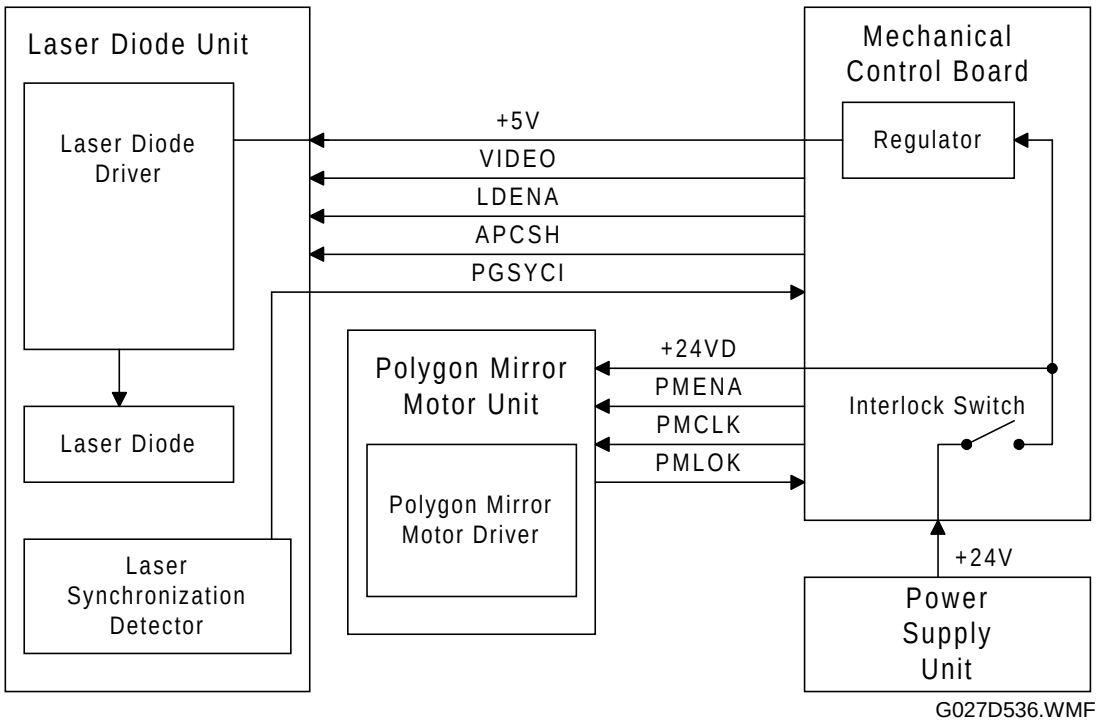
A : Laser Diode Unit
B : Polygon Mirror Motor
C : F-theta Lens
D : First Mirror
E : Second Mirror
F : Laser Synchronization Detector
G : Cylindrical Lens
H : Synchronization Detector Lens
J : Shutter

This machine uses a laser diode to produce an electrostatic latent image on the OPC drum. The laser diode unit converts image data from the mechanical control board into laser pulses, and the optical components direct these pulses to the OPC drum.

The strength of the beam emitted from the laser diode is 0.21 milliwatts at a wavelength of 785 ± 20 nanometers.

As a mechanical safety feature, the shutter [J] closes to block the laser beam path whenever the upper unit is opened.

Block Diagram



The Mechanical Control Board controls the laser diode power (APCSH) and transfers data for printing to the laser diode (VIDEO). As an electrical safety feature, there is a interlock switch on the Mechanical Control Board. This switch cuts +24 volts whenever the upper unit is opened.

Error Conditions

Laser Error

The machine detects laser synchronization signal pulses (PGSYCI) 70 milliseconds after the (LDENA) signal is sent. It detects a laser error if the pulse count does not reach the specified number within 100 milliseconds.

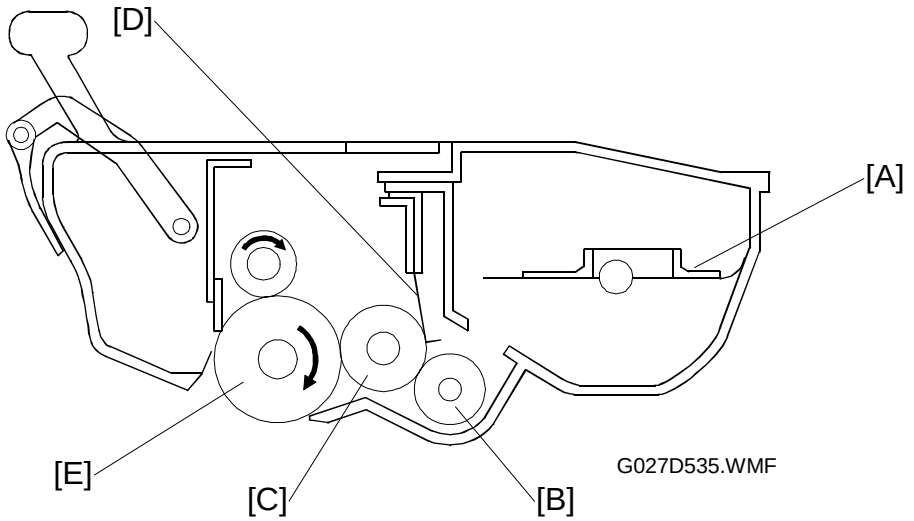
When this occurs, the machine warns the customer on the LCD panel (Error 56).

Polygon Mirror Motor Error

The machine detects a polygon mirror motor error when the (PMLOK) signal does not go low within 10 seconds of the (PMENA) signal. When this occurs, the machine warns the customer on the LCD panel (Error 57).

2.2.4 DEVELOPMENT

Overview



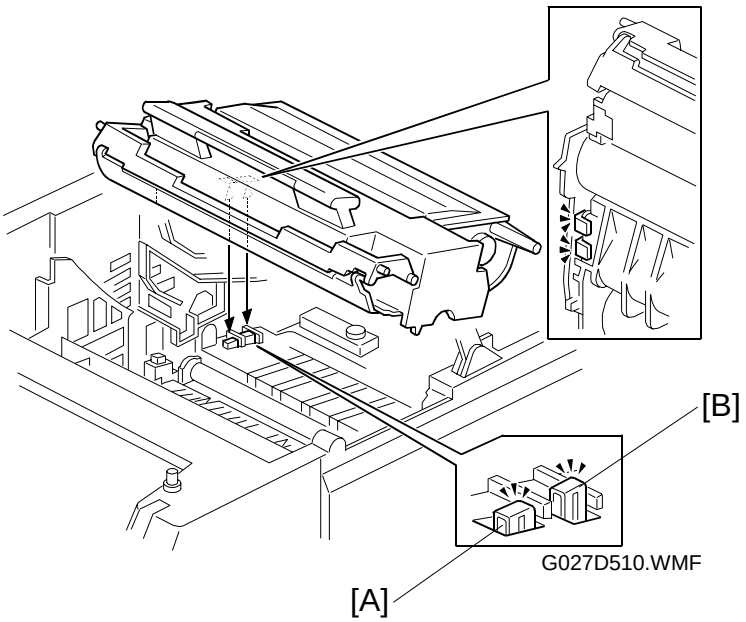
This machine uses monocomponent toner, which is composed of resin and ferrite. The toner mixing bar [A] stirs and carries toner to the toner application roller [B]. The toner application roller supplies toner to the development roller [C]. As the development roller turns past the toner metering blade [D], only a thin coating of negatively charged toner particles stays adhered.

The diameter of development roller is 16 millimeters and the toner application roller is 12.8 millimeters.

During printing, a bias voltage of -650 volts is applied to the toner application roller and another bias voltage of -400 volts is applied to the development roller. The toner is transferred from the toner application roller to the development roller by the potential difference between these two rollers.

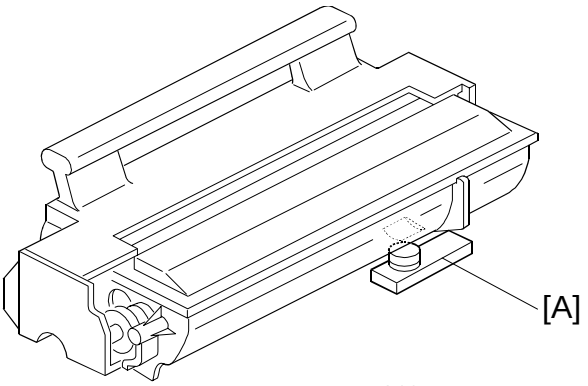
The exposed area on the drum [E] is at -100 volts. The development roller applies toner to these areas of the latent image as they turn past the drum.

At the start and the end of all print process (including the cleaning and initial toner supply modes), 0 volt is applied to the toner application roller, and +250 volts is applied to the development roller. This is to avoid any toner transfer to the drum.



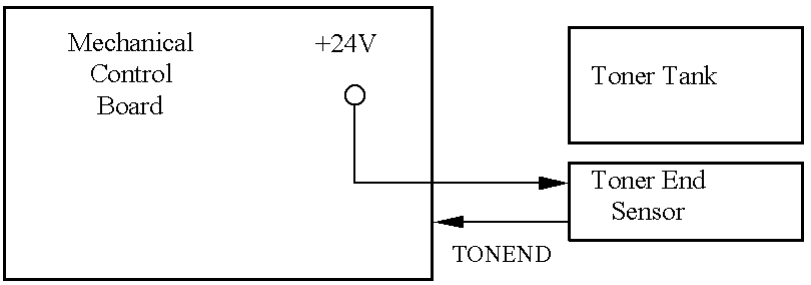
The voltage to the development roller and the toner application roller is supplied through the terminals [A and B] from the mechanical control board.

TONER END DETECTION



G027D511.WMF

Toner near-end is detected by the toner end sensor [A], which is below the toner tank of the toner cassette.



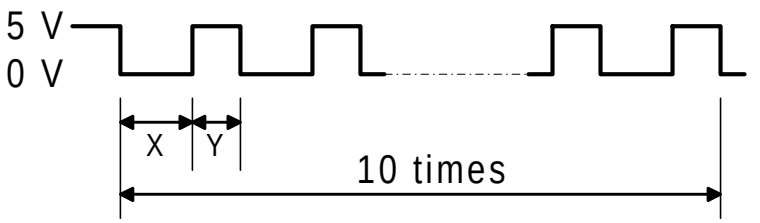
G027D532.WMF

While the main motor is rotating, the machine monitors the voltage (TONEND) output from the toner end sensor. The voltage from the sensor is high when the toner tank is full. When the toner tank is almost empty, the output of the toner end sensor starts occasionally dropping low as the toner level changes with the stirring of the toner mixing bar.

Toner near-end condition

When the Mechanical Control Board detects the following output from the toner end sensor, “Toner near-end” is displayed on the LCD. (This is the toner near-end condition).

Output of toner end sensor



G027D733.WMF

0.6 s < X and Y < 2 s

The machine clears the toner near-end condition if the output from the toner end sensor goes back high for more than 5 seconds.

Toner end condition

If the machine makes more than 100 copies during the toner near-end condition or the mechanical control board detects a low output for more than 9.2 seconds, it disables copying and “Add toner” is displayed on the LCD. This is the toner end condition.

Toner end recovery

Replacing the toner cassette clears the toner end condition. If the main switch is turned off and back on, or the upper unit is opened and closed during the toner near-end condition or toner end condition, the machine assumes that the toner cassette has been replaced. It then rotates the main motor for toner cassette initialization. At the same time, the mechanical control board monitors the output from the sensor. The machine clears the toner end condition if the mechanical control board detects a high output from the toner end sensor for more then 5 seconds.

Toner saving mode

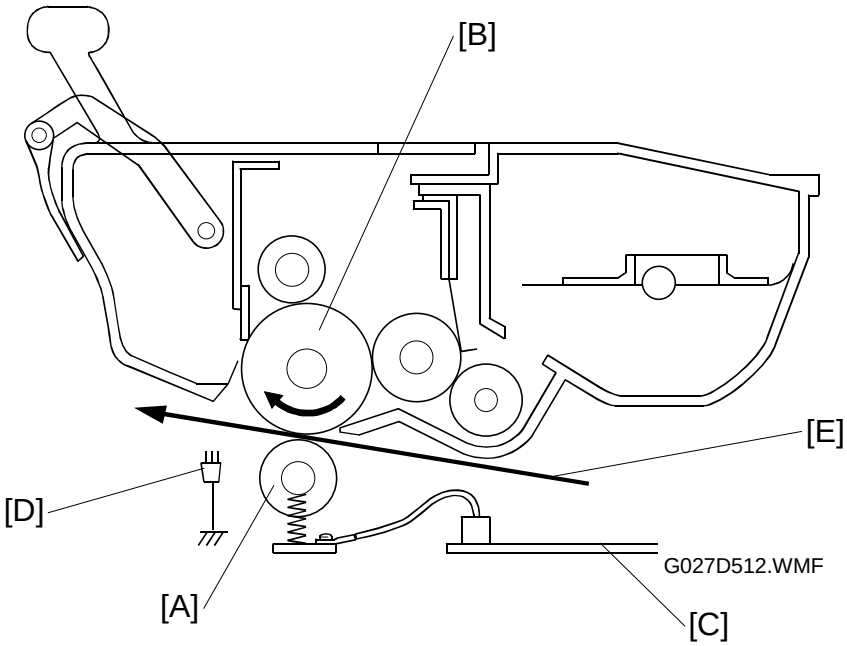
In this mode, the machine prints by cutting out some of the pixels of the video data (about 30%) to save toner.

This mode can be selected by changing bit 2 of user bit switch 02.

SwUser 02—bit 2
0: OFF (default setting)
1: ON

2.2.5 TRANSFER AND SEPARATION

Overview



This machine uses a transfer roller [A], which touches the OPC drum [B] surface. A constant current of +4.3 μA (6.0 μA for envelopes) is applied to the transfer roller from the mechanical control board [C]. The positively biased transfer roller pulls negatively charged toner off the drum. The curvature of the drum and the antistatic brush [D] help the paper [E] to drop away from the drum.

The diameter of transfer roller is 14.6 millimeters.

Cleaning Mode

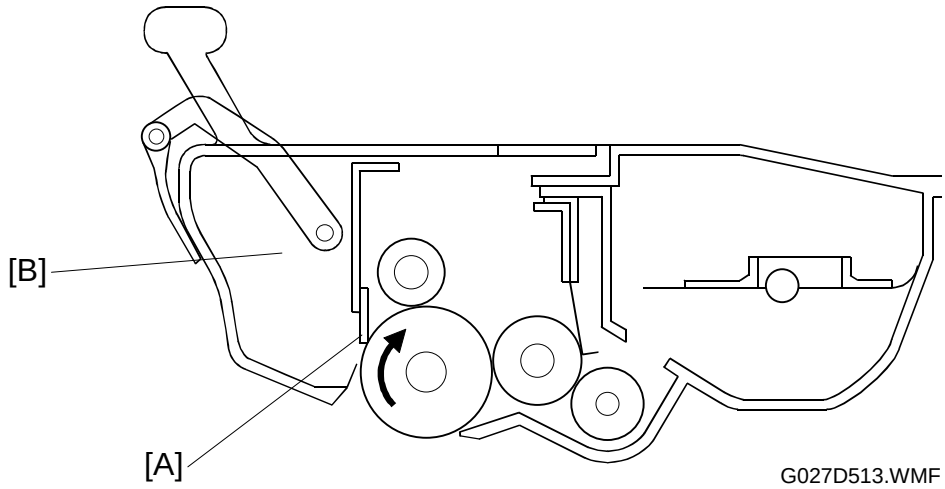
If a paper jam occurs during printing, toner may be transferred to the transfer roller surface. To prevent this toner from transferring to the under side of the paper, the transfer roller has to be cleaned before the next printing run.

While the machine is in the cleaning mode, the mechanical control board applies -1000 volts to the transfer roller, and charges the drum to -750 volts. The negatively charged toner on the transfer roller is then transferred back to the drum.

The machine goes through the cleaning mode in the following conditions.

- At power-up: The process starts when the fusing temperature reaches half of the standby temperature.
- When the cover is opened and then closed during the printing process.
- After a printer jam has been cleared.

2.2.6 DRUM CLEANING



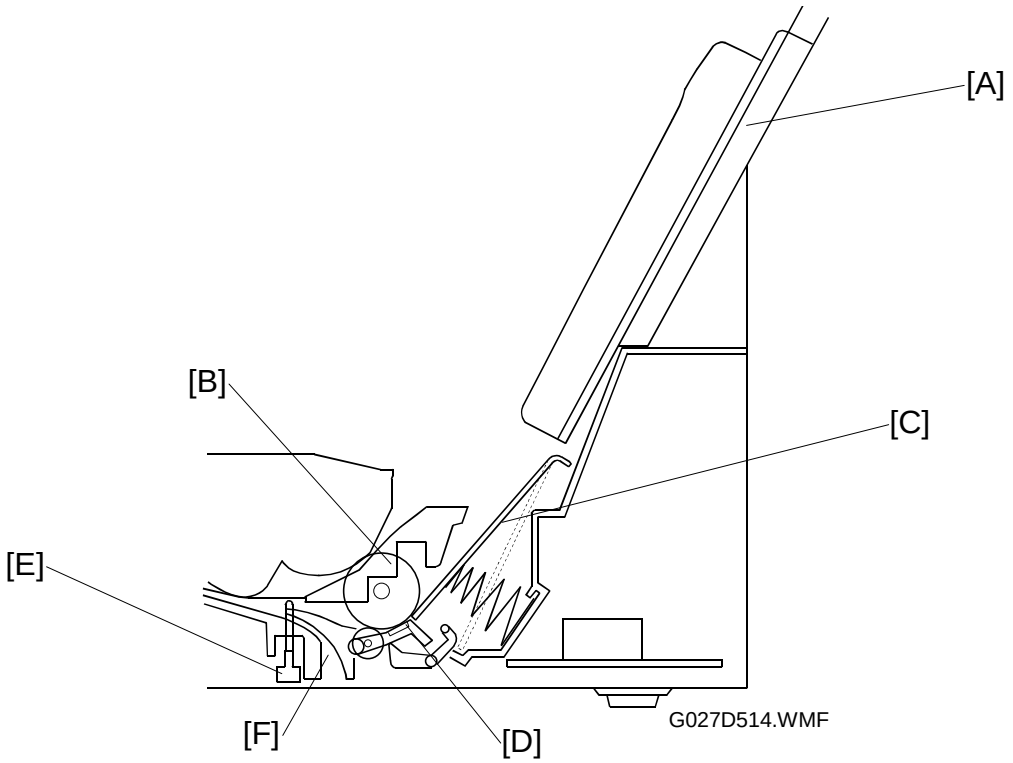
The cleaning blade and the used toner tank are contained in the toner cassette.

A counter blade system is used for drum cleaning. The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. This removed toner is stored in the used toner tank [B].

There is no used toner overflow detection mechanism because the used toner tank is large enough for the lifetime of the toner cassette.

2.2.7 PAPER FEED AND REGISTRATION

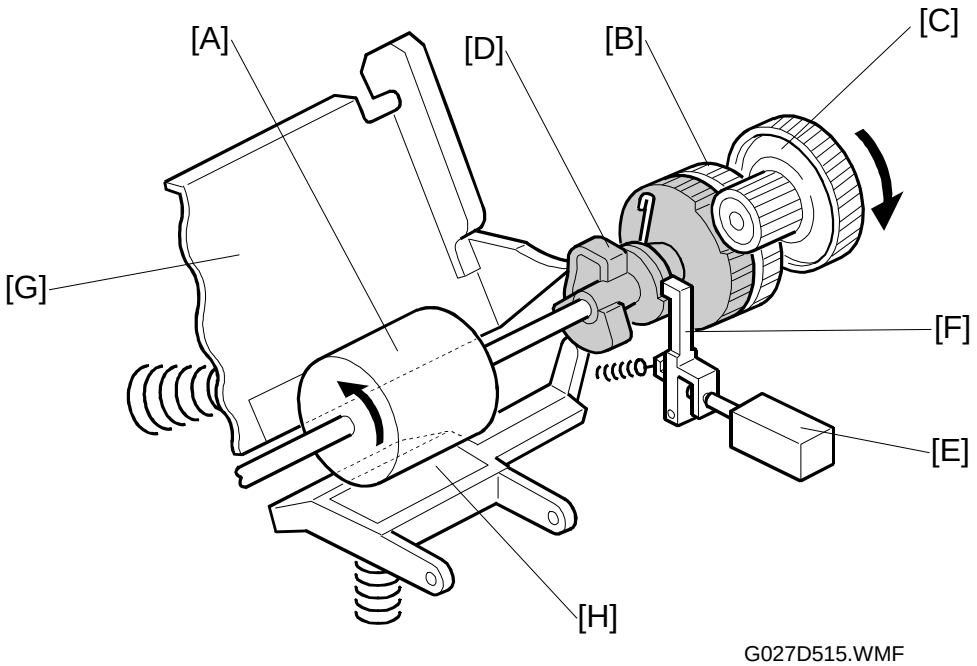
Overview



The upper paper tray [A] holds 100 sheets. The left side fence on the paper tray is adjustable to fit to the paper size. The paper feed roller [B] is located on the right side of the machine so that it can feed a narrow sheet of paper. The feed roller, the upper tray bottom plate [C], and the friction pad [D] allow only one sheet to feed from the paper tray. They are controlled by the pick-up cam. (See the next page.) The registration sensor [E] detects the leading edge of the paper and synchronizes paper feed with the activation of the laser diode to write the image on the OPC drum. The space [F] is the entrance for paper from the optional paper feed unit.

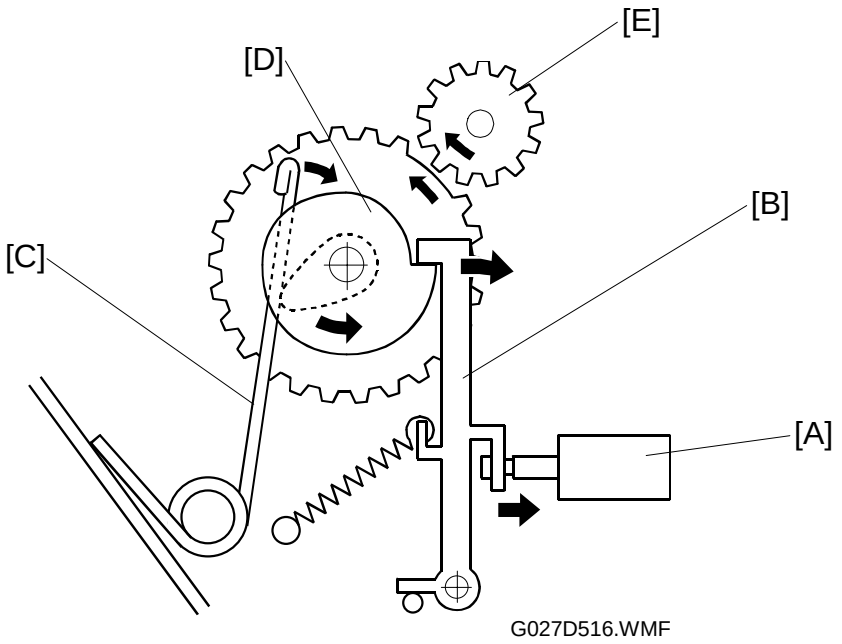
Paper Feed Mechanism

Idling condition



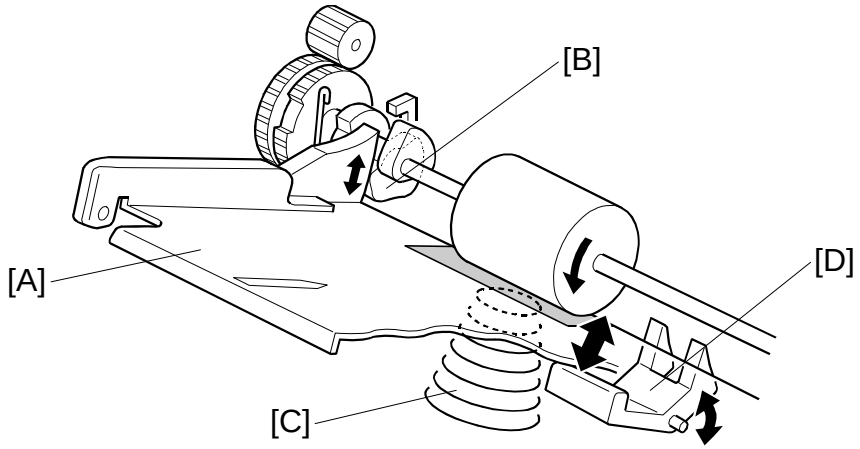
The paper feed roller [A] always rotates while the main motor rotates, since drive from the motor is transmitted to the feed roller gear [B] (which is fixed to the roller shaft through the paper feed drive gear [C]). The pick-up cam [D] idles on the shaft of the feed roller. This cam (shown by shading in the illustration) is a complex part with four cam surfaces and a gear. When the paper pick-up solenoid [E] is not energized, the cam stopper [F] locks the cam in the idling position. In this position, it holds the upper tray bottom plate [G] and the friction pad [H] away from the feed roller. The rotation of the main motor is not transmitted to the pick-up cam through the gear because cogs are not provided on the section of the cam gear that faces the drive gear during idling.

Pick-up cam drive mechanism



When the machine sends the trigger signal to feed paper, the paper pick-up solenoid [A] is energized for 0.3 seconds to release the cam stopper [B]. The pressure of the cam spring [C] then causes the pick-up cam [D] to rotate counterclockwise as shown in the illustration. The cogs of the cam gear and the paper feed drive gear [E] then engage, and rotation form the main motor is transmitted to the cam. After the cam completes one rotation, the cam stopper locks the cam and the cam idles again.

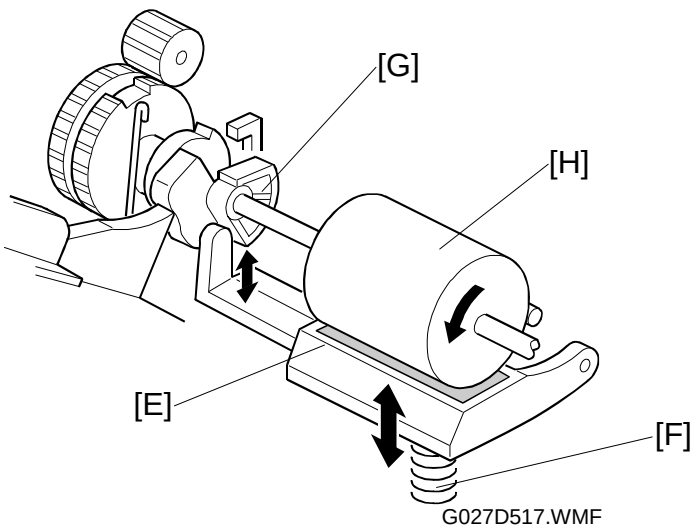
Upper tray bottom plate operation



G027D518.WMF

The position of the upper tray bottom plate [A] is determined by the pick-up cam [B]. When at the idle position, the cam holds the bottom plate away from the feed roller. However, when the cam rotates, the bottom plate spring [C] presses the bottom plate toward the feed roller. When the bottom plate is pressed up, it releases the paper stopper [D] and the paper on the bottom plate contacts the feed roller. The feed roller then feeds one sheet past the friction pad. As the cam continues to rotate, it forces the bottom plate back down and the paper stopper [D] separates the paper from the feed roller. After the cam completes one rotation, it stops turning and holds the bottom plate in the idle position.

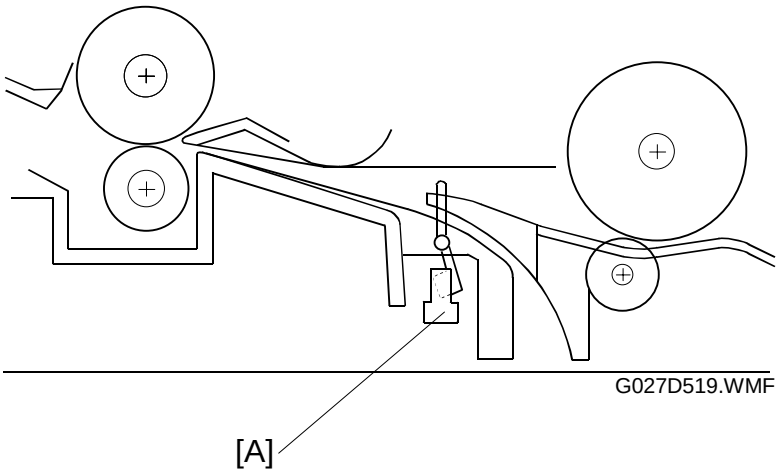
Friction pad operation



G027D517.WMF

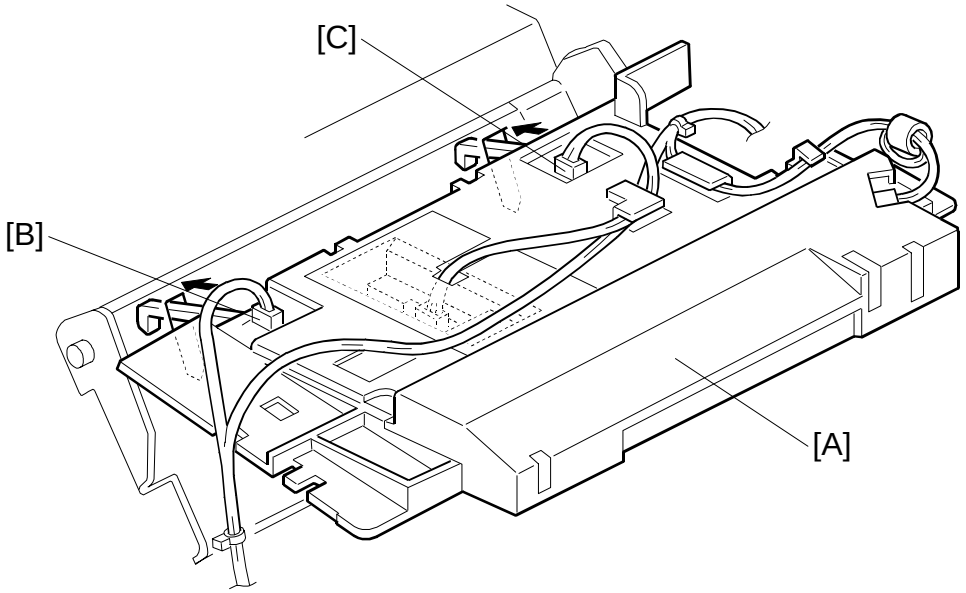
The friction pad [E] is pressed up by the friction pad spring [F]. The friction pad's position is changed by the rotation of the pick-up cam [G]. When the pad is pressed up after the cam starts to rotate, the pad contacts the feed roller. Then the feed roller [H] feeds paper to the registration section. The friction pad allows only the top sheet to feed. As the cam continues to rotate it forces the friction pad back down, and after one rotation, the pad returns to the idle position.

Registration



The registration sensor [A] is installed in the exit of the paper feed section. This sensor detects the leading edge of the paper and synchronizes paper feed with the writing of the image on the drum, so that the image and paper match up properly. This sensor also detects paper feed jams.

PAPER WIDTH AND PAPER END DETECTION



G027R110.WMF

The laser unit [A] has two sensors built into it. One, the paper width sensor [B], measures the width of the paper in the upper tray. The other, the paper end sensor [C] detects the presence or absence of paper. Each of these sensors has an actuator that extends through a slot in the upper tray bottom plate, so that the sensor is actuated when paper is set in the upper tray.

The paper width sensor is activated when the width of paper in the upper tray is more than 203 millimeters (8"). Whenever the machine starts printing, it checks the width of the paper in the upper tray. If the width is more than 203 millimeters (8"), it starts printing. However, if the width is less than 203 millimeters (8"), the machine starts printing only if the paper widths registered for both the machine and the printer driver are less than 203 millimeters (8"). If either of these settings is more than 203 millimeters (8"), a warning message is displayed in the LCD.

When the upper tray runs out of paper, the actuator of the paper end sensor moves into the slot in the upper tray bottom plate. This informs the CPU that paper has run out.

Jam Detection

Paper jam at the upper paper tray

When the registration sensor does not turn on within 5.5 seconds after the paper pick-up solenoid for the upper tray turns on (Error 50).

Paper jam at the optional lower paper tray

When the registration sensor does not turn on within 7.0 seconds after the paper feed solenoid for the lower paper tray turns on (Error 54).

Paper did not reach at the fusing unit

When the paper exit sensor does not turn on within 5.0 seconds after the registration sensor turns on (Error 51).

Paper did not pass the registration sensor

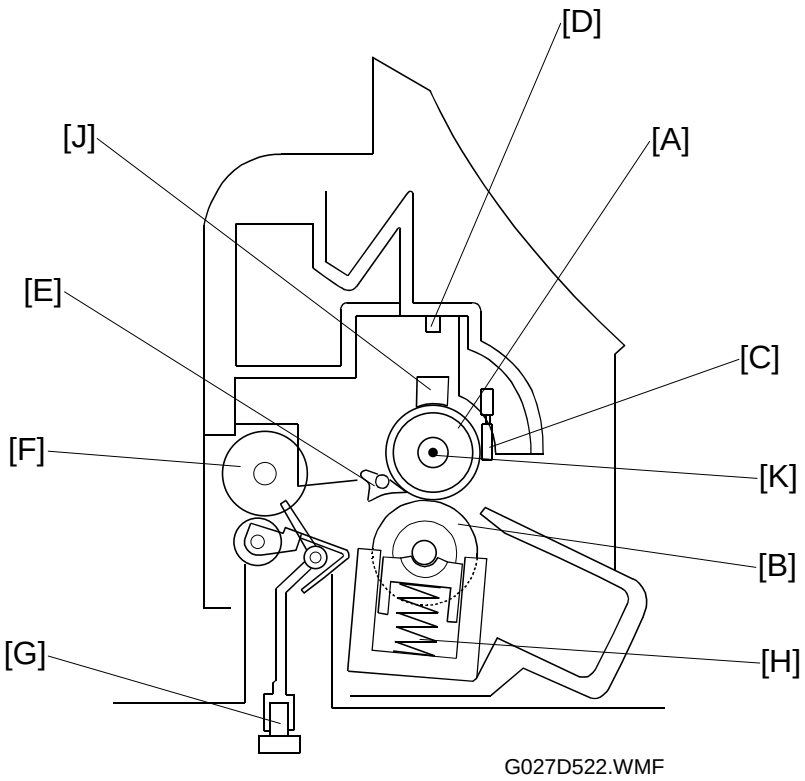
When the registration sensor does not turn off within 9.3 seconds after the paper exit sensor turns on (Error 52).

Paper jam in the fusing exit area

When the paper exit sensor does not turn off within 4.0 seconds after the registration sensor turns off (Error 53).

2.2.8 FUSING

Overview



After the image is transferred, the copy paper enters the fusing unit. The image is fused to the copy paper by applying heat and pressure through the use of a hot roller [A] and pressure roller [B].

The CPU monitors the hot roller temperature through a thermistor [C] that is in contact with the hot roller surface. A thermofuse [D] protects the fusing unit from overheating.

The hot roller strippers [E] separate the copy paper from the hot roller and direct it to the exit rollers [F]. The exit sensor [G], which is located under the fusing unit, monitors the progress of the copy paper through the fusing unit and acts as misfeed detector. The exit rollers [F] drive the copy paper to the paper tray.

Springs [H] at the front and rear apply the proper fusing pressure between the hot roller and pressure roller.

The cleaning pad [J] cleans paper dust and toner from the hot roller surface. The cleaning pad must be replaced whenever the toner cassette is replaced. The cleaning pad is packed with the toner cassette.

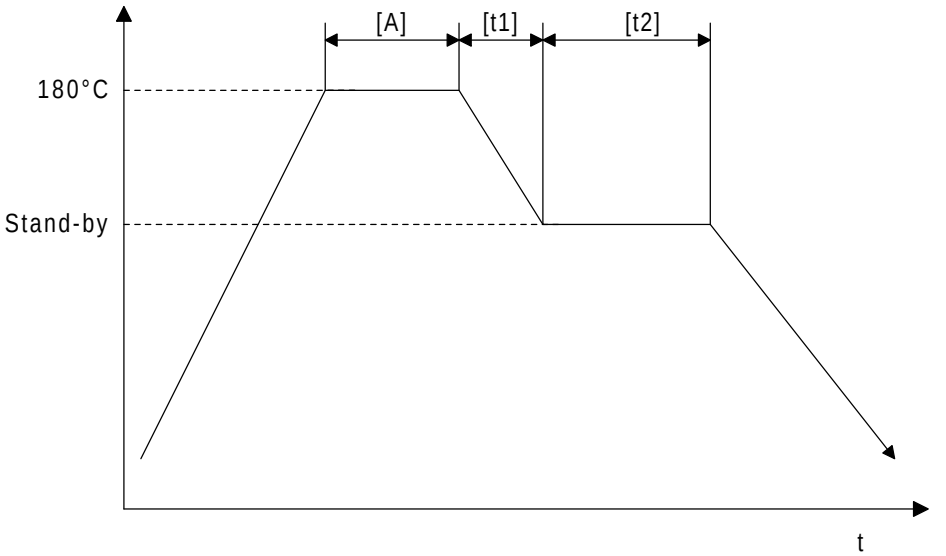
Thermistor maximum: 235°C

Thermofuse maximum: 121°C (The temperature of the hot roller would be about 400°C.)

There are two types of fusing lamp [K]—120 volts and 230 volts.

Power Save Control

When the main switch is turned on, the machine turns on the fusing lamp. For printing, the machine raises the fusing temperature to 180°C. The fusing temperature is kept at 180°C during printing.



G027D538.WMF

When the power saver timer expires, the machine automatically goes into energy saver mode.

Power saver timer

t1 = 5 minutes.

- After time interval t1 passes following printing, copying, scanning, or key-in [A], the LCD and all LED's go off.

t1 + t2 = 15 minutes or 240 minutes (selectable)

- Default value is 15 minutes. (Economy Mode)
- Pressing the Clear Modes key more than one second will change this condition.
- When the Economy Mode LED is lit, t1 + t2 = 15 minutes.
- When the Economy Mode LED is not lit, t1 + t2 = 240 minutes.

Power Saver Mode

After t1 + t2 time passed following printing, copying, scanning, or key input, the fusing lamp goes off (power saver mode turns on).

The default mode has power saver mode on. However, selecting SW user 02 as follows can turn it off.

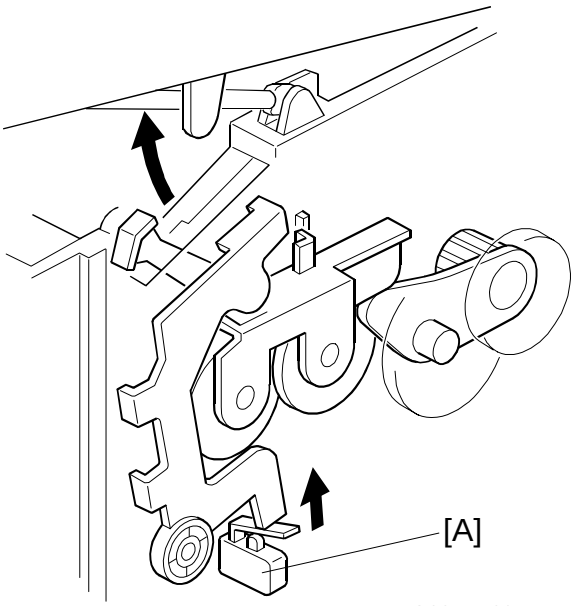
- SW User 02 -

Bit 5	Bit 4	
0	0	Power saver mode is off (the machine stays in the stand-by condition) Stand-by temperature G025 model: 110°C G027 model: 130°C
1	0	Power saver mode is on

The machine exits energy saver mode when:

- A key is pressed.
- Data is input from the PC.
- A document is inserted into the ADF.
- The upper unit is opened and closed.
- Ringing is detected.
- Detection that the external telephone is off hook.
- The paper tray sensor for the paper feed unit is turned off and on.

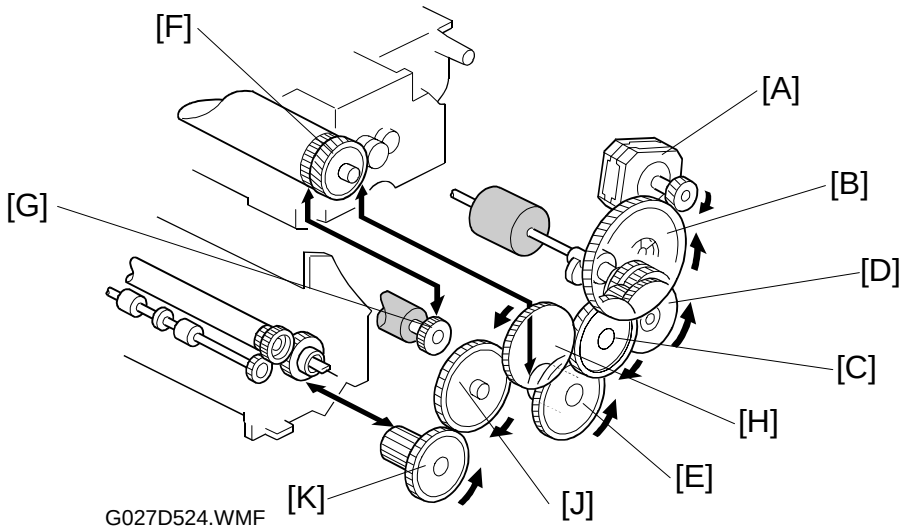
2.2.9 COVER SWITCH



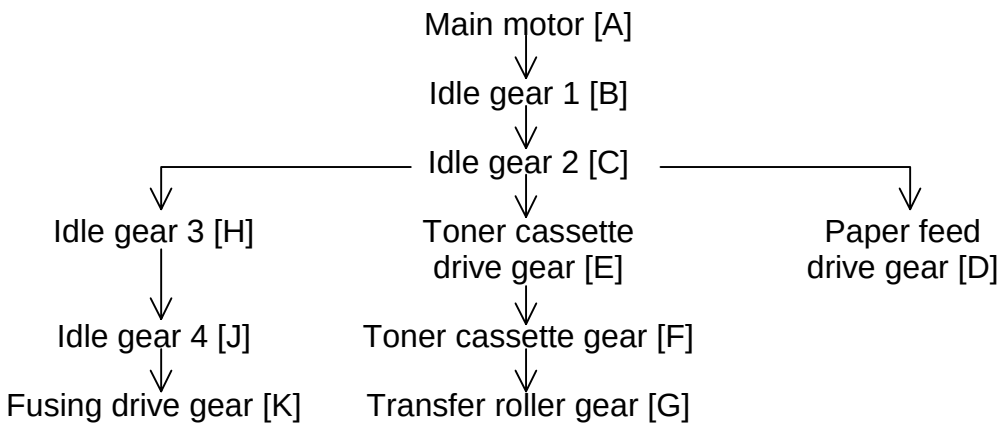
When the upper unit is opened, the interlock switch [A] will be opened and power supply to the following parts will be cut.

- Power pack
- Laser diode driver
- Fan motor
- Main motor
- Polygon mirror motor
- Fusing lamp
- Paper pick-up solenoid
- Optional paper feed unit

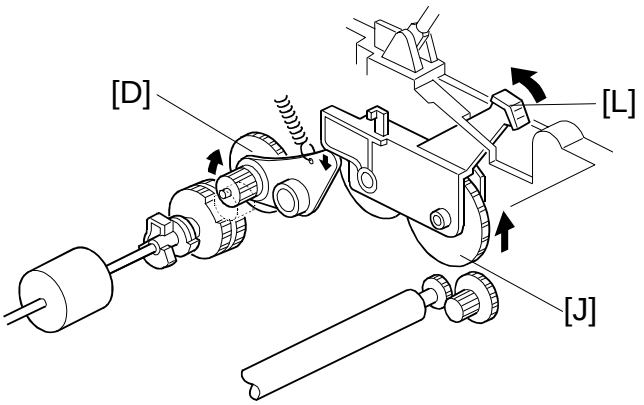
2.2.10 PAPER FEED DRIVE RELEASE AND FUSING DRIVE RELEASE



The main motor drives the paper feed unit, the transfer roller, the toner cassette, and fusing unit through a series of gears as follows.

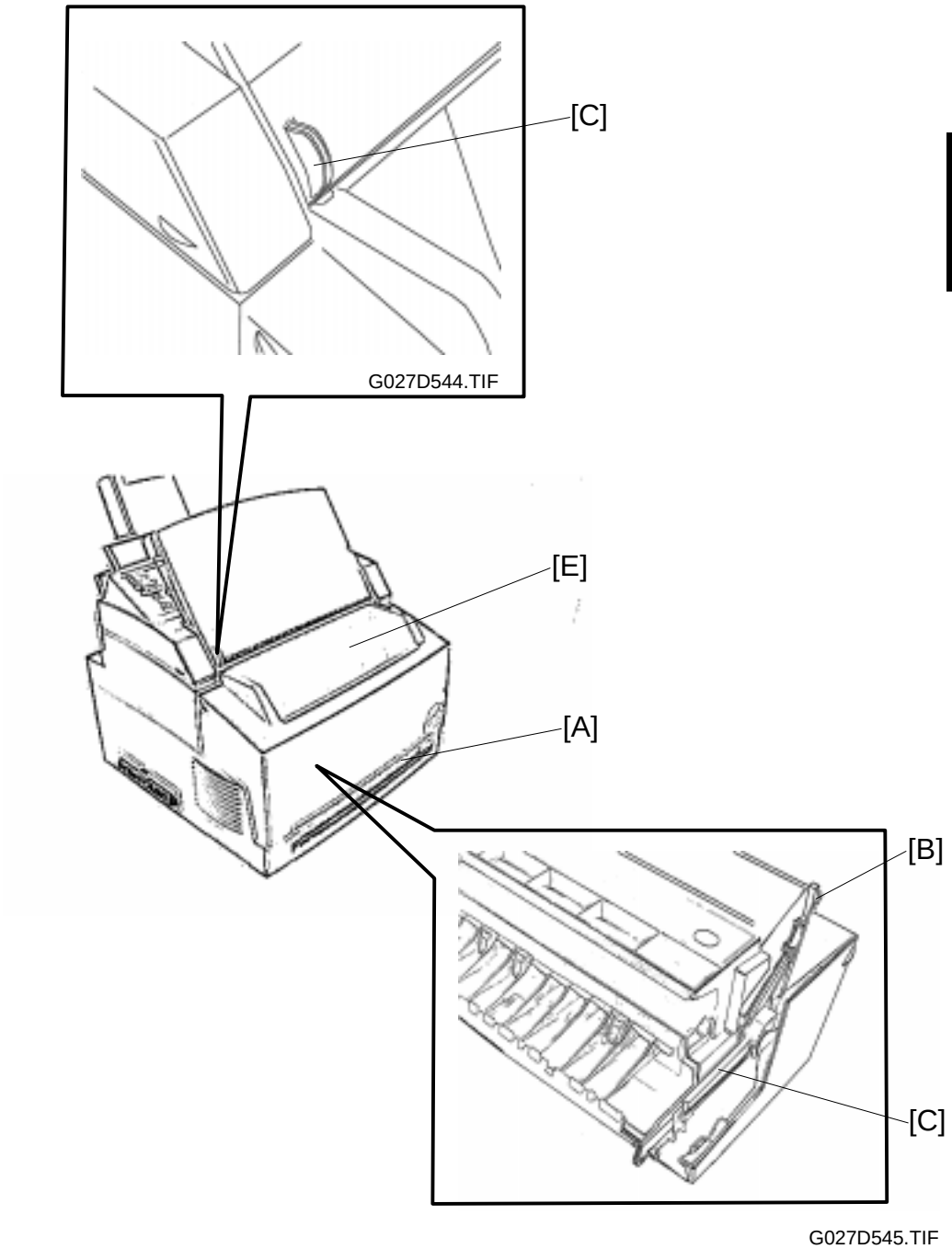

Main motor [A]
Idle gear 1 [B]
Idle gear 2 [C]
Idle gear 3 [H]
Toner cassette drive gear [E]
Paper feed drive gear [D]
Idle gear 4 [J]
Toner cassette gear [F]
Fusing drive gear [K]
Transfer roller gear [G]

When the paper release lever [L] on the right side of the machine is lifted, the paper feed drive gear [D] and idle gear [J] disengage so that jammed paper can be removed.



G027D525.WMF

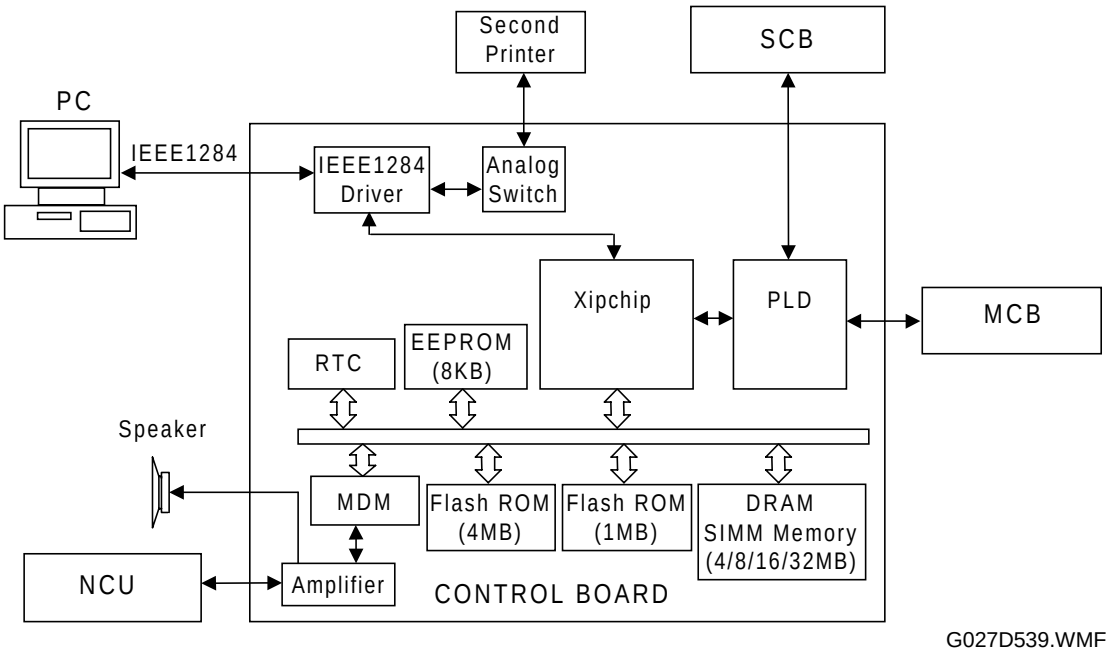
2.2.11 PAPER EXIT CHANGE MECHANISM (G025 ONLY)



When the document tray is positioned horizontally, the machine feeds out a sheet of paper to the paper exit [A].
When the document tray rises up, the actuator [B] is pushed by the projection [C] on the reverse side of the document tray. The actuator pushes the lever [D], changing the paper exit. This causes the paper to turn up and feeds out to the paper stack holder [E].

2.3 PCBS

2.3.1 CONTROL BOARD



Overall

The control board controls the machine with the assistance of the mechanical control board (MCB) and scanner control board (SCB). It contains a Xipchip, PLD, MDM, RTC, flash ROM, EEPROM, DRAM, IEEE1284 connector, driver, and analog switch. The DRAM is plugged into a SIMM socket so that it can be changed easily by a user.

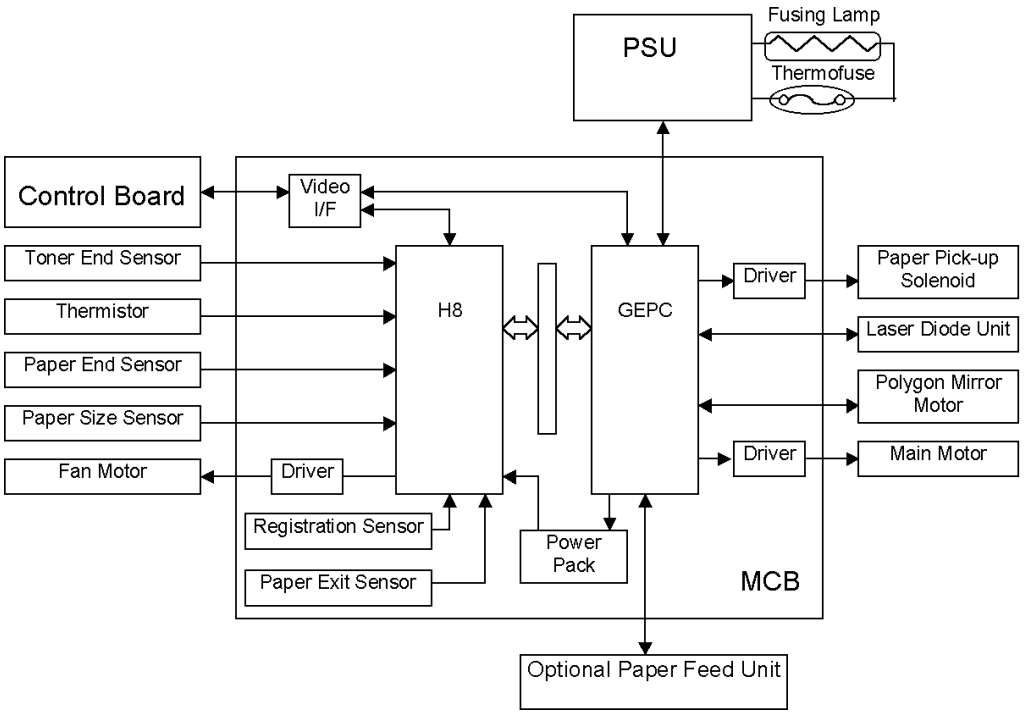
Functions

1. PC printing process control
2. PC scanning process control
3. Copying process control
4. Facsimile process control (group 3, maximum 14400 bps)
5. Halftone image process (photo1: dithering, photo2: error diffusion)
6. Smoothing control
7. JBIG/ABIG control
8. IEEE1284 I/O port control
9. Second printer control
10. Clock, voltage monitoring
11. Monitor speaker drive

Components

1. Xipchip
   This is a multi-function peripheral controller. It functions as a CPU and an image processor.
2. Memory
   - Flash ROM (4 MB/1 MB): For the firmware
   - EEPROM (8 KB): For individual data such as country code, factory adjustments and so on.
   - DRAM (4 MB as standard): Working area for the Xipchip, image data, and so on.
3. PLD
   This chip functions as the interface for the SCB and MCB.
4. MDM
   This chip is the modem for 14.4 KBPS G3 facsimile communication
5. RTC
   This chip has the following functions:
   - Clock
   - Lithium battery
   - Voltage monitoring
6. IEEE1284 driver
   This chip is the IEEE1284 parallel interface driver.
7. Analog switch
   This switch makes this machine function as a printer exchanger. Data for printing passes through this switch to the second printer.

2.3.2 MCB (MECHANICAL CONTROL BOARD)



G027D542.WMF

Overall

The mechanical control board (MCB) controls devices related to the printer and optional paper feed unit.
The MCB contains a CPU (H8), peripheral control gate array (GEPC), video I/F chips, motor drivers, power pack, and on-board sensors.

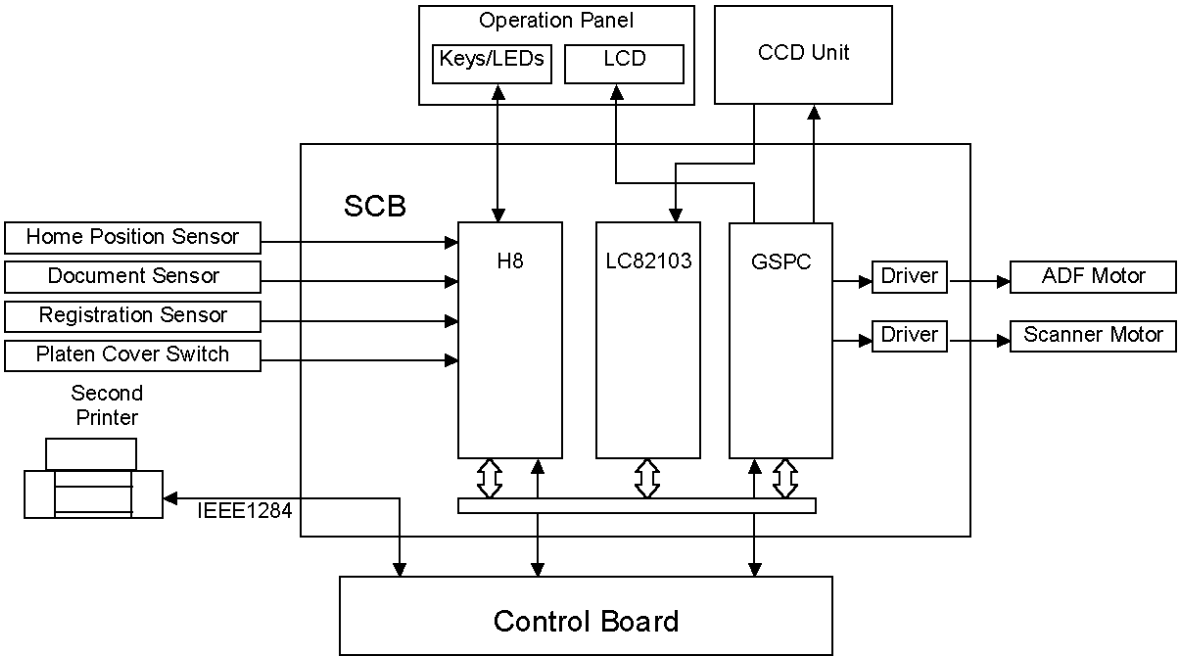
Functions

1. To control the main motor, laser diode driver, polygon mirror motor, sensors, and so on.
2. To control fusing temperature through the power supply unit (PSU).
3. To generate high voltages for development bias, charge voltage, and transfer voltage.
4. To control the optional paper feed unit.

Contents

1. H8
   This eight-bit CPU controls the MCB. It receives outputs from sensors and the thermistor.
2. GEPC
   This chip contains an I/O port and controls the main motor, laser diode driver, polygon mirror motor, optional paper feed unit, and so on. This chip generates the pulse width modulation signal to control the power pack.
3. Video I/F
   This chip is the interface for the control board.
4. Sensors
   The registration sensor and paper exit sensor are built into this board.

2.3.3 SCB (SCANNER CONTROL BOARD)



G027D543.WMF

Overall

The scanner control board (SCB) controls devices related to the scanner unit and operation panel. The SCB contains a CPU (H8), peripheral control gate array (GSPC), image processing LSI (LC82103), motor drivers, and an IEEE1284 connector for the second printer.

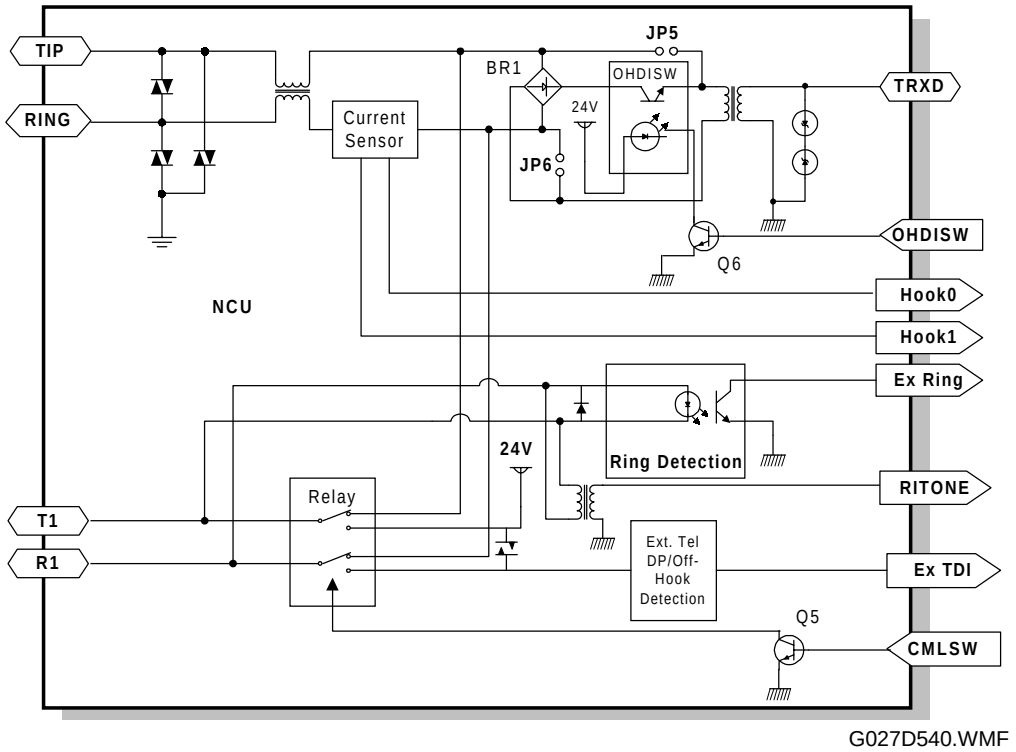
Functions

1. Flatbed scanner mechanism control (G027 only)
2. ADF mechanism control
3. CCD unit control
4. Operation panel control
5. Second printer connector

Contents

1. H8
   This eight-bit CPU controls the SCB. It receives output from sensors.
2. GEPC
   This chip contains an I/O port and it controls the scanner motor (G027 only), ADF motor, CCD unit, and LCD.
3. LC82103
   This chip is an image processing LSI. It converts the analog signal from the CCD unit to a digital signal.

2.3.4 NCU (USA)

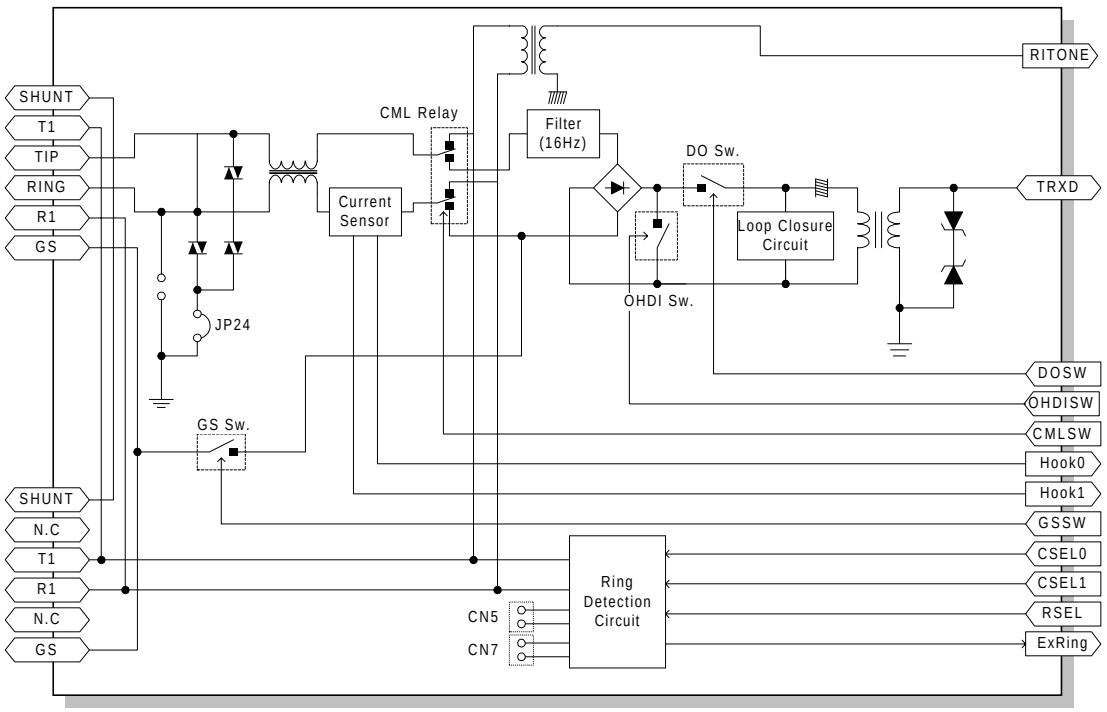


G027D540.WMF

Jumpers

Item	Description
JP5	These jumpers are for dry line connection, however, this machine does not support a dry line connection.
JP6	

2.3.5 NCU (EUROPE/ASIA)



G027D541.WMF

Control Signals and Jumpers

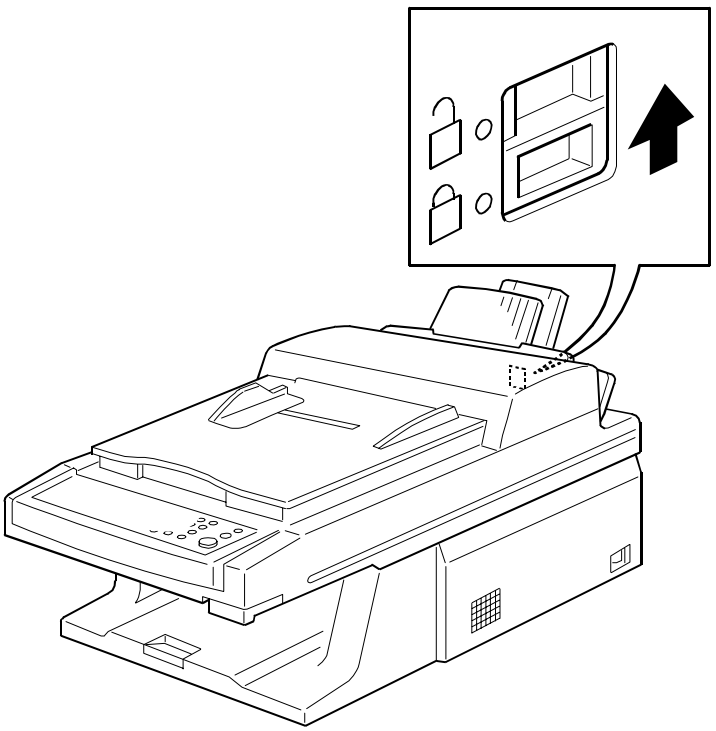
	CSEL0	CSEL1	RSEL	JP24	CN5	CN7
Country	**CN2-4**	**CN2-5**	**CN1-13**			
Germany	L	H	H	S	O	O
Holland	L	H	H	S	O	O
Austria	L	H	H	S	O	O
Italy	L	L	L	S	O	O
Spain	L	L	L	S	O	O
Ireland	H	L	L	S	S	S
Finland	L	H	L	S	O	O
Switzerland	L	H	L	O	O	O
Other	L	H	L	S	O	O
	L: Low, H: High			**S: Short, O: Open**		

3. INSTALLATION

3.1 INSTALLING THE MACHINE

Refer to Operator's Manual for information on the installation environment and how to install and set up the machine.

G027 model only



G027R010.WMF

The CCD unit lock [A] prevents the CCD unit from moving during transportation.

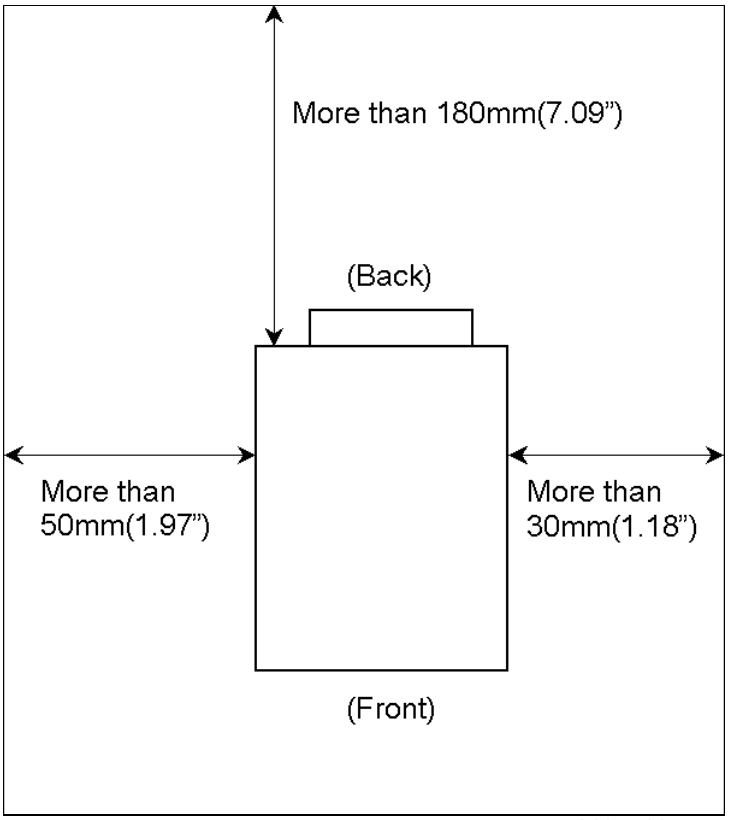
Slide the lock to the "UNLOCK" position before power-on.

Important:

1. If you forget to unlock the CCD unit, an error message "Error 90" will appear on the display. If this happens, turn off the machine and unlock the CCD unit before turning it back on.
2. If you want to move the machine to a different location, you have to slide the CCD unit lock to the "LOCK" position before transportation.

3.2 MINIMUM SPACE REQUIREMENTS

Place the machine near the power source, providing clearance as shown:



G027I502.WMF

4. SERVICE TABLES AND PROCEDURES

4.1 SERVICE LEVEL FUNCTIONS

4.1.1 SERVICE LEVEL FUNCTION LIST

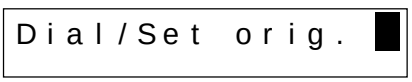
Service Function		Functions
No.	Description	
52	User Parameters	Set the following parameters: User, service, and country switches
71	Modem Test	Send the following signals from the modem to the NCU: 14400/12000/9600TCM/7200TCM/9600/7200/ 4800/2400/300 bps, 2100/1100 Hz
72	DTMF Test	Send out the DTMF tone to the NCU
73	Output Level	Adjust the line output level
74	Ram Clear	Erase data and initialize parameters
81	System Parameter	Print the system parameter list
82	Change Memory	Display and change RAM data
83	Print Memory	Print RAM data
91	RAM Test	Test RAM and EEPROM
92	Key Test	Test the keys
93	LED Test	Test the LEDs
94	LCD Test	Test the LCD
95	Speaker Test	Send out the 1100 Hz tone to the speaker
97	Factory Mode	Factory use only. Cannot be used in the field.

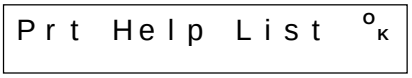
⚠CAUTION

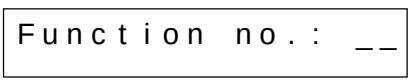
Do not turn off the power when the LCD displays “Please wait” or “Registered”.

4.1.2 ENTERING SERVICE FUNCTION MODES

1. Press [OK] then [Stop] three times in succession within three seconds.
2. Press [Help/Function].
3. Press [Zoom ▸].







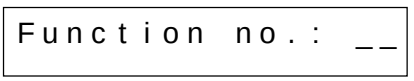
4.1.3 EXITING THE SERVICE MODE

Wait forty seconds or turn the machine off and on to exit user function or service function modes.

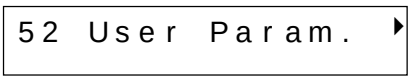
4.2 SERVICE FUNCTION OPERATION

4.2.1 USER PARAMETER (BIT SWITCH) PROGRAMMING

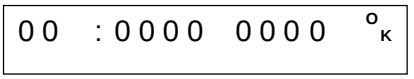
1. Enter service function mode.



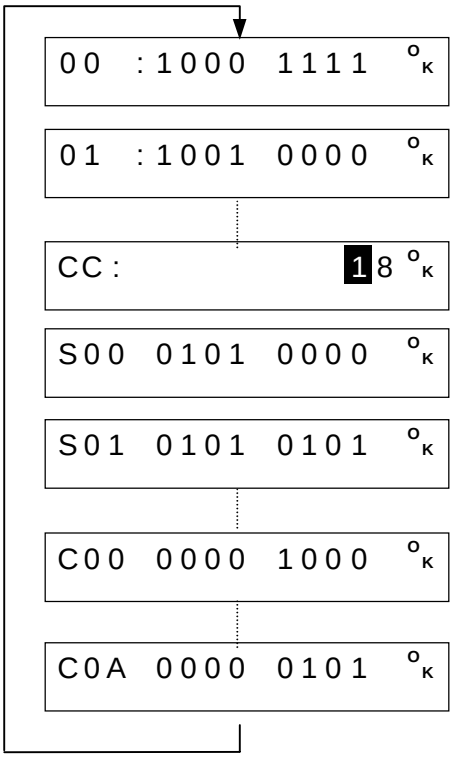
2. Press [5] [2].



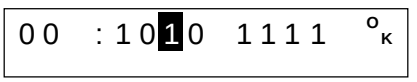
3. Press [OK].
   NOTE: Bit switch number 00 is displayed.



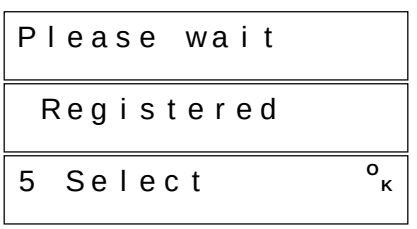
4. Press the [Zoom–] and [Zoom+] keys, to change the selected parameter.



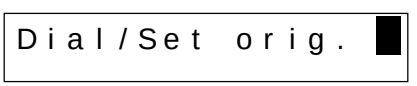
5. Press the number key [0] - [7] to change the bit value from 0 to 1 or from 1 to 0 (except "CC").
   Example: To change bit 5, press [5]. To return the value, press the same number again.
   NOTE: Bit number 7 is at the left end of the display.



6. Press [OK].
   NOTE: The machine stores the changed parameter and goes to the selection step (another service tool can be selected here).



7. Press [Stop] to exit this function.



4.2.2 MODEM TEST [FUNCTION 71]

1. Enter service mode.

```
Function no.: __
```

2. Press [7] [1].

```
71 Modem Test
```

3. Press [OK].

```
Testing...
```

4. Press [#].
   NOTE: The modem sends a 14400 bps signal to the NCU.

```
Testing... 14400
```

5. Press [#] or [∗] to change the test signal.
   NOTE: The test signal can be changed cyclically by pressing the [#] or [∗] keys.
   14400 bps, 12000 bps, 9600 bps TCM, 7200 bps TCM, 9600 bps, 7200 bps, 4800 bps, 2400 bps, 300 bps, 2100 Hz, 1100 Hz
6. Press [Stop] to exit this function.

```
Dial/Set orig.
```


4.2.3 DTMF TEST [FUNCTION 72]

1. Enter service mode.

```
Function no.: __
```

2. Press [7] [2].

```
72 DTMF Test
```

3. Press [OK].

```
Testing...
```

4. Press the number key that you wish to test.

   Example: Press [0] to test the tone for [0].

```
Testing...  0
```

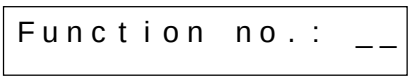
   NOTE: The machine displays the pressed key number and sends out its DTMF signal to the NCU. The selectable signals are as follows.
   [1, 2, 3, 4, 5, 6, 7, 8, 9, 0, ∗, #]

5. Press [Stop] to exit this function.

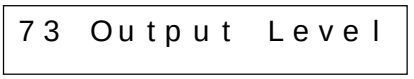
```
Dial/Set orig.
```

4.2.4 OUTPUT LEVEL [FUNCTION 73]

1. Enter service mode.



2. Press [7] [3].



3. Press [OK].

   NOTE: The machine sends out the 1100 Hz signal with the registered output signal level.

   Example: The registered output signal level is –12 dBm.

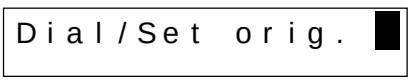
4. Press [∗] to increase or [#] to decrease the output signal level.

   Example: To change the output signal level from –12 dBm to –10 dBm, press [∗] twice.

   NOTE: The signal level can be from –15 dB to 0 dB.

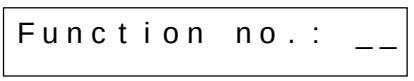
   NOTE: The changed value is registered automatically.

5. Press [Stop] to exit this function.



4.2.5 RAM CLEAR [FUNCTION 74]

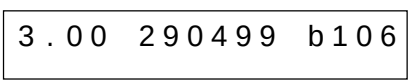
1. Enter service mode.



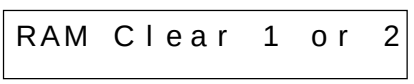
2. Press [7] [4].

3. Press [OK].

   NOTE: Software version information is displayed.



4. Press [OK].



NOTE: The function has two types of RAM clear mode.
RAM clear 1: Erase all stored data (including clock data) and initialize all parameters to their default setting.
RAM clear 2: Erase all stored data and initialize parameters to their default settings except for the following settings:
Clock data, SwFunc 00 bit 0 and bit 1, SwFunc 04, SwServ 04 to 10, SwCntry 00 to 0A, Parameters for PTT regulations.

5. Press [1] or [Zoom–] to select RAM clear 1 mode.
   Press [2] or [Zoom+] to select RAM clear 2 mode.

Are You Sure?

6. Press [OK]. The machine will then execute the RAM clear mode.

Please wait

7. Then the machine enters initialization mode automatically.

Restarting...

   NOTE: Installed SIMM capacity is displayed.

4MB

   NOTE: After the RAM is cleared, the machine exits service mode automatically.

Dial/Set orig.

4.2.6 SYSTEM PARAMETER LIST [FUNCTION 81]

1. Enter service mode.

Function no.: __

2. Press [8] [1].

81 System Para.

3. Press [OK].

Printing ...

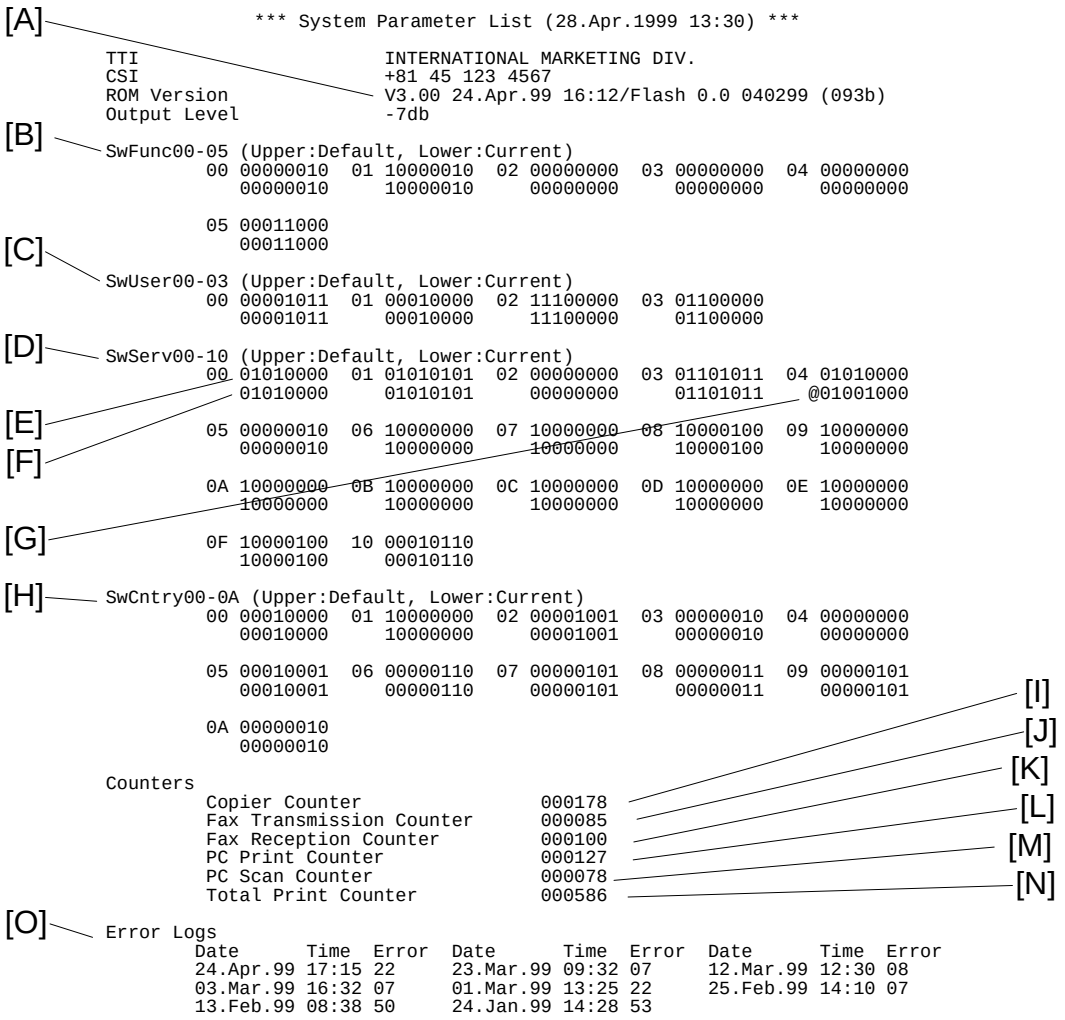
4. After printing.

8 Reconfigure

5. Press [Stop] to exit this function.

Dial/Set orig.

System parameter list details

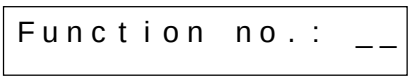


G027M500.WMF

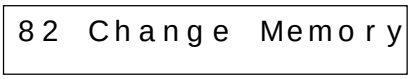
[A]: Firmware version information
[B]: Function switch parameters
[C]: User switch parameters
[D]: Service switch parameters
[E]: Default setting data
[F]: Current setting data
[G]: @ mark attached if the current setting is different from the default setting.
[H]: Country switch parameters
[I]: Copier counter
[J]: Fax transmission counter
[K]: Fax reception counter
[L]: PC print counter
[M]: PC scanning counter
[N]: Total print counter, which includes list and report printing.
[O]: Latest error codes (maximum: 30)

4.2.7 RAM DISPLAY/REWRITE [FUNCTION 82]

1. Enter service mode.



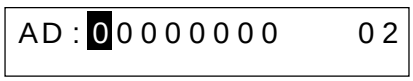
2. Press [8] [2].



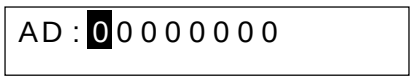
3. Press [OK].

4. Press [Zoom–] to select hexadecimal mode or Press [Zoom+] to select binary mode.

   NOTE: In hexadecimal mode, AD in the LCD stands for address. The first 8 digits are the RAM address, and the next 2 digits are the contents.

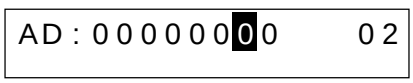


   NOTE: When in binary mode, the data is not displayed at the same time as the address.



Hexadecimal Mode

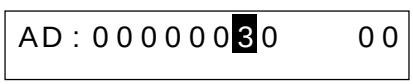
5. After entering hexadecimal mode, press [Zoom+] or [Zoom–] to move the blinking cursor.
   Example: After pressing [Zoom+] six times, the cursor moves right as shown.



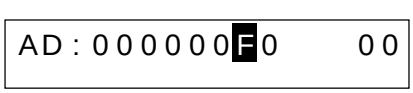
6. Press the following keys to change the value of the blinking digit.

Description	Key Name	Description	Key Name
Value increment	#	Set Value to 7	7
Value decrement	*	Set Value to 8	8
Set Value to 0	0	Set Value to 9	9
Set Value to 1	1	Set Value to A	A
Set Value to 2	2	Set Value to B	B
Set Value to 3	3	Set Value to C	C
Set Value to 4	4	Set Value to D	D
Set Value to 5	5	Set Value to E	E
Set Value to 6	6	Set Value to F	Fax/Copy

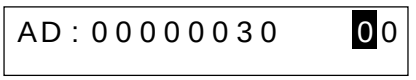
Example: To change the value from 0 to 3, press [#] three times or press [3].



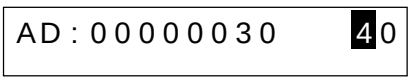
Example: To change the value from 0 to F, press [*] once or press [Fax/Copy].



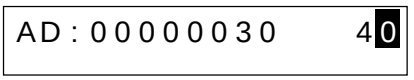
7. Press [Start] to move the cursor to the data field.

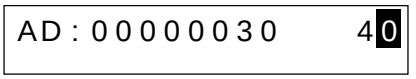


8. Press [#] or [∗] or [0] – [Fax/Copy] to change the data.
   Example: To change the value from 0 to 4, press [#] four times or press [4].

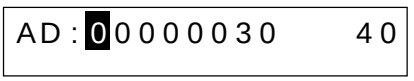


9. Press [Zoom+] or [Zoom–] to move the cursor.
   Example: After pressing [Zoom +] once, the cursor moves right.

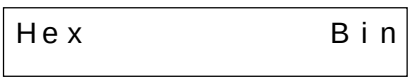




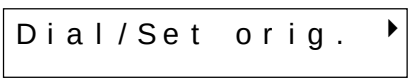
   NOTE: If necessary, press [Start] to move the cursor to the address field again.



10. Press [OK] to store the new data.

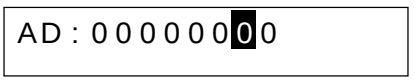


11. Press [Stop] to exit the hexadecimal mode.



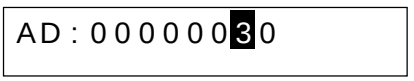
Binary Mode

12. After entering binary mode (refer to step 4) press [Zoom+] or [Zoom–] to move the cursor.
    Example: After pressing [Zoom+] six times, the cursor moves 6 spaces to the right as shown.

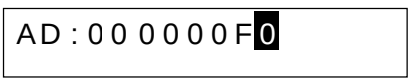


13. Press [#] or [∗] or [0] – [Fax/Copy] to change value at the cursor.

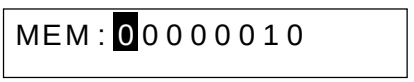
    NOTE: Refer to the table in step 6 for details.
    Example: To change the value from 0 to 3, press [#] three times or [3].



    Example: To change the value from 0 to F, press [∗] once or [Fax/Copy].

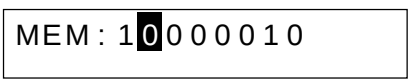


14. Press [Start] to display the data field.

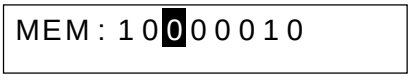


    NOTE: The data field is displayed in binary as shown on the right.

15. Press [#] or [∗] or [1] or [0] to change the data.
    Example: To change the value from 0 to 1, press [#] once or [1].



16. Press [Zoom+] or [Zoom–] to move the cursor.
    Example: After pressing [Zoom+] once, the cursor moves right as shown.



NOTE: If necessary, press [Start] to display the address field again.

AD:00000000

17. Press [OK] to store the new data.

Hex Bin

18. Press [Stop] to exit this function.

Dial/Set orig.

4.2.8 RAM DUMP [FUNCTION 83]

1. Enter service mode.

Function no.: __

2. Press [8] [3].

83 Print Memory

3. Press [OK].
NOTE: The printing start address is displayed in hexadecimal code.

Start:00000000

4. Press [Zoom+] or [Zoom–] to move the cursor.

Example: To change the cursor as shown on the right, press [Zoom+] six times.

Start:0000000

5. Enter the printing start address by using the following keys.

Description	Key Name	Description	Key Name
Set Value to 0	0	Set Value to 8	8
Set Value to 1	1	Set Value to 9	9
Set Value to 2	2	Set Value to A	A
Set Value to 3	3	Set Value to B	B
Set Value to 4	4	Set Value to C	C
Set Value to 5	5	Set Value to D	D
Set Value to 6	6	Set Value to E	E
Set Value to 7	7	Set Value to F	Fax/Copy

Example: To change the value to 3, press [#] three times or press [3].

Start:0000003

6. Press [OK].
NOTE: The printing end address is displayed in hexadecimal code..

End:00000FF

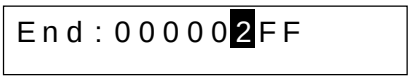
7. Press [Zoom+] or [Zoom–] to move the cursor.

Example: To move the cursor as shown on the right, press [Zoom+] five times.

End:00000FF

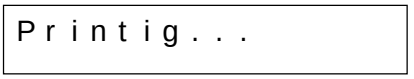
8. Change the value of the digit by using [0] to [Fax/Copy].

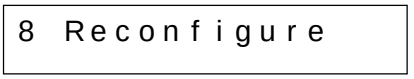
   Example: To change the value to 2, press [2].



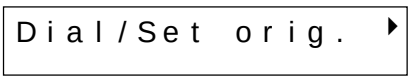
9. Press [OK].
   Printing starts.

   NOTE: If you want to stop printing immediately, press [Stop].



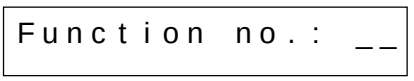


10. Press [Stop] to exit this function.

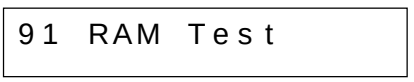


4.2.9 RAM TEST [FUNCTION 91]

1. Enter service mode.



2. Press [9] [1].

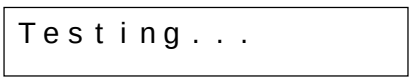


3. Press [OK].

4. Press [Zoom+] to select the DRAM area or [Zoom–] to select the EEPROM area. The machine immediately executes the test.

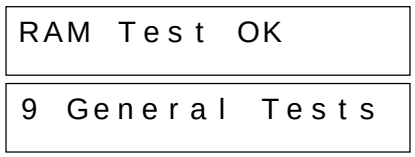
   NOTE: The DRAM test needs about 50 seconds (for 4 MB SIMM) and the EEPROM test requires about fourteen minutes to finish.

   NOTE: While excuting both EEPROM and DRAM tests, pressed keys are ignored.

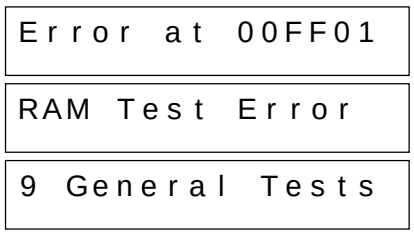


5. After testing is finished, the test result is displayed.

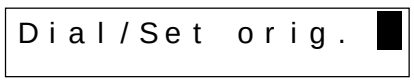
Example: If there is no error, "RAM Test OK" is displayed for two seconds then, "9 General Tests" is displayed.



Example: If an error occurs, the error address is displayed for three seconds, then "RAM Test Error" is displayed. Press [OK] to return to test select mode.

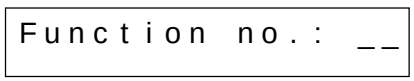


6. Press [Stop] to exit RAM test mode.

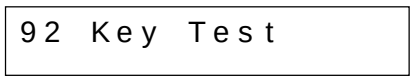


4.2.10 KEY TEST [FUNCTION 92]

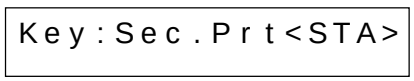
1. Enter service mode.



2. Press [9] [2].



3. Press [OK].

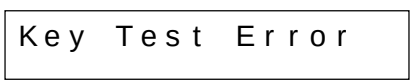


NOTE: The name of the first test key is displayed.

4. Press [Second Printer].

NOTE: If the key functions properly, the machine displays the name of the next test key.

NOTE: If the key does not function properly or a different key is pressed, the machine displays "Key Test Error".



Displayed Names	Actual Key Names	Displayed Names	Actual Key Names
Sec.Prt	Second Printer	On Hook	On Hook Dial
A	A	Clear	Clear
B	B	Key:1	1
C	C	Key:2	2
D	D	Key:3	3
E	E	Key:4	4
		Key:5	5
Txt/Pho	Text/Photo	Key:6	6
Tel/Fax	Tel/Fax	Key:7	7
F/C Sel	Fax/Copy	Key:8	8
Density	Density	Key:9	9
Help/Fu	Help/Function	Key:*	*
Minus	Zoom–	Key:0	0
Plus	Zoom+	Key:#	#
OK	OK	Cl.Mode	Clear Modes
Name	Name	Stop	Stop
Pause	Pause	Start	Start

NOTE: Press [OK] to cancel the error display and exit key test mode.

```
Dial/Set orig.
```

7. When all the key tests are completed, “Key Test OK” is displayed for two seconds.

```
Key Test OK
```

```
9 General Tests
```

8. Press [Stop] to exit key test mode.

```
Dial/Set orig.
```

4.2.11 LED TEST [FUNCTION 93]

1. Enter service mode.

```
Function no.: __
```

2. Press [9] [3].

```
93 LED Test
```

3. Press [OK].
   NOTE: All the LEDs on the operation panel light.

```
Testing...
```

4. Press [OK].

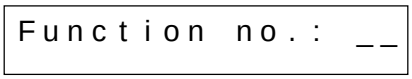
```
9 General Tests
```

5. Press [Stop] to exit LED test mode.

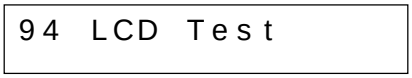
```
Dial/Set orig.
```

4.2.12 LCD TEST [FUNCTION 94]

1. Enter service mode.

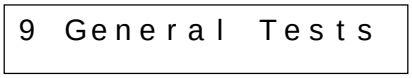


2. Press [9] [4].

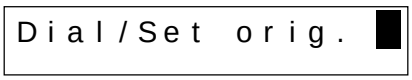


3. Press [OK].
   NOTE: All the LCD pixels turn black.

4. Press [OK].

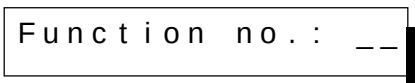


5. Press [Stop] to exit LCD test mode.

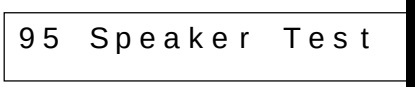


4.2.13 SPEAKER TEST [FUNCTION 95]

1. Enter service mode.

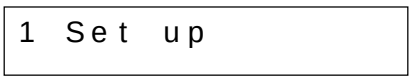


2. Press [9] [5].

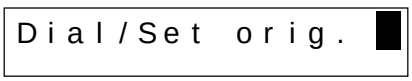


3. Press [OK].
   NOTE: An 1100 Hz tone is sent to the speaker.

4. Press [OK].



5. Press [Stop] to exit speaker test mode.



4.3 BIT SWITCHES

⚠CAUTION

Do not adjust bit switches labeled "Not used", as this may cause the machine to malfunction. Such bits are only for use in other regions, such as Japan.

⚠CAUTION

Do not turn off the power while the LCD displays "Please wait" or "Registered".

NOTE: After setting the bit switches, turn the power off and on to cause the change to take effect.

4.3.1 FUNCTION SWITCH PARAMETERS (SWFUNC)

Function switch parameters appear on the System Parameter List (service function 81) as SwFunc00 – 05; however, they cannot be accessed or changed using the service mode functions.

SwFunc 00 (Function Switch 00)		
No	**FUNCTION**	**NOTE**
0-7	Number for the remote change from TEL to FAX	00 – 09 (H) Default value: 02(H)

SwFunc 01 (Function Switch 01)		
No	**FUNCTION**	**NOTE**
0	Not used	Do not change this setting
1	Dialing type 0: Pulse dialing (10pps) 1: Tone (DTMF) dialing	
2-3	PSTN access method from behind a PABX Bit 3 2 Setting 0 0 PSTN 0 1 Loop start 1 0 Ground start (Europe & Asia models only, excluding France models) 1 1 Flash start (Europe & Asia models only)	
4	Not used	Do not change this setting
5	Remote change from Fax mode to Tel mode 0: Disabled 1: Enabled	

SwFunc 01 (Function Switch 01)		
No	**FUNCTION**	**NOTE**
6	Authorized reception 0: Disabled 1: Enabled	
7	TTI printing 0: Off 1: On	

SwFunc 02 (Function Switch 02)		
No	**FUNCTION**	**NOTE**
0-7	PSTN access number for loop start Access number Hex value 0 80 01 81 | | 09 89 1 01 | | 9 09 10 0A 11 0B | | 99 63	The bits show the PSTN access number for loop start that is programmed in Function 12 (Dial mode). The number '00 ' cannot be used as the PSTN access number.

SwFunc 03 (Function Switch 03)		
No	**FUNCTION**	**NOTE**
0-5	Not used	Do not change this setting
6	Slow transmission start (transmission start at 4800 bps) 0: Disabled 1: Enabled	
7	Daylight saving time 0: Disabled 1: Enabled	The daylight saving time feature differs with the country number setting as follows. -North American When this bit is to 1, the clock is automatically advanced or set back one hour at the pre-determined date for Daylight Saving Time. -Other countries One minute after this bit is changed to 1, the clock advances by an hour. Similarly, one minute after this bit changes to 0, the clock is put back an hour.

SwFunc 04 (Function Switch 04)		
No	**FUNCTION**	**NOTE**
0-3	Language selection Bit 3 2 1 0 Language 0 0 0 0 English 0 0 0 1 French 0 0 1 0 Spanish 0 0 1 1 Italian 0 1 0 0 German 0 1 0 1 Swedish 0 1 1 0 Polish 0 1 1 1 Hungarian 1 0 0 0 Czech 1 0 0 1 Dutch 1 0 1 0 Danish 1 0 1 1 Norwegian 1 1 0 0 Portuguese Other settings Not used	The default language depends on the Country Code. Even if the language is changed, the country code does not automatically change.
4-7	Not used	Do not change these settings

SwFunc 05 (Function Switch 05)		
No	**FUNCTION**	**NOTE**
0-7	Not used	Do not change these settings

4.3.2 USER SWITCH PARAMETERS (SWUSER)

00: SwUser 00 (User Switch 00)		
No	**FUNCTION**	**NOTE**
0	Automatically reduce received images to fit on the page 0: Off 1: On	Default: On (except Germany) If this bit is changed to 0, some parts of the image may be lost.
1	Not used	Do not change this setting
2	Automatic unauthorized call report printout 0: Off 1: On	Default: Off
3	Automatic journal printout 0: Off 1: On	Default: On When this bit is set for on, journal printout occurs automatically after 35 communications.
4	Automatic transmission report printout (immediate transmissions) 0: Off 1: On	Default: Off
5	Maximum transmittable document length when scanning from the ADF 0: 400 mm 1: 1200 mm	Default: 400 mm
6	Display "Original left on glass" warning if there is an original in the ADF at power on. 0: Enable 1: Disable	Default: Enable **G027 only**
7	Width scanned when faxing a document 0: A4 1: LT/LG	Default: A4 (except North America)

01: SwUser 01 (User Switch 01)		
No	**FUNCTION**	**NOTE**
0-1	Home position of scanning mode for transmission Bit 1 Bit 0 Setting 0 0 Text (Standard) 0 1 Text (Fine) 1 0 Photo1 (Dither) 1 1 Photo2 (Error diffusion)	Default: Text (Standard) This setting is available when the machine's home position is set to fax operation mode. (SwUser 01 bit 7: 0)
2-3	Home position of scanning density for transmission Bit 3 Bit 2 Setting 0 0 Auto 0 1 Darker 1 0 Lighter 1 1 Not used	Default: Auto This setting is available when the machine's home position is set to fax operation mode. (SwUser 01 bit 7: 0)
4	Selection of home position settings (bits 0 – 3) 0: Disabled 1: Enabled	Default: Enabled
5-6	Not used	Do not change these settings
7	Fax/Copy home position 0: Fax 1: Copy	Default: G025: Fax G027: Copy

02: SwUser 02 (User Switch 02)		
No	**FUNCTION**	**NOTE**
0-1	Not used	Do not change these settings
2	Toner saving mode 0: Off 1: On	Default: Off
3	Printer resolution 0: 600 dpi 1: 300 dpi	Default: 600 dpi
4-5	Power saver mode Bit 5 Bit 4 Setting 0 0 Off 0 1 Not used 1 0 On 1 1 Not used	Default: On These settings are not mentioned in the operation manual
6	Limited substitute reception if no CSI received 0: Possible 1: Impossible	
7	Limited substitute reception 0: Off 1: On	Default: On

03: SwUser 03 (User Switch 03)		
No	**FUNCTION**	**NOTE**
0-4	Not used	Do not change this setting
5	Paper type in the optional paper feed unit 0: A4 1: Letter	Default: A4 (except North America)
6	Not used	Do not change this setting
7	RDS function 0: Off 1: On	Default: Off

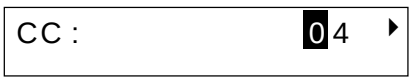
4.3.3 COUNTRY CODE

The number stored with this procedure is higher by one from the number stored with SwCntry 03.
Example: France – CC = 01, SwCntry 03 = 00
Also, CC is displayed as a decimal number. However, the bit switch setting is displayed as a binary number, and hex coding is used.

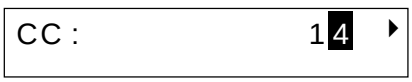
Country No.	Country	Country No.	Country	Country No.	Country
01	France	13	Portugal	25	Singapore
02	Germany	14	Netherlands	26	Malaysia
03	U. K.	15	Spain	27	China
04	Italy	16	Israel	28	Taiwan
05	Austria	17	Canada	29	do not use
06	Belgium	18	U. S. A.	30	do not use
07	Denmark	19	Asia	31	do not use
08	Finland	20	Japan	32	do not use
09	Ireland	21	Hong Kong	33	Turkey
10	Norway	22	South Africa	34	Greece
11	Sweden	23	Australia		
12	Switzerland	24	New Zealand		

Example: To change the country number from 04 (Italy) to 15 (Spain)

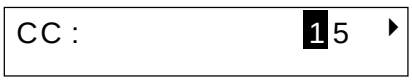
1. Enter the CC display mode of function 52.



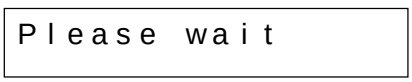
2. Press [1].



3. Press [5].



4. Press [OK].



4.3.4 SERVICE SWITCH PARAMETERS (SWSERV)

NOTE: The Service Switches and the Country Switches appear under the user parameter menu, when using the service mode.

The default settings are shown on the system parameter list. Please refer to section 4.2.6 for more detailed information.

S00: SwServ 00 (Service Switch 00)		
No	**FUNCTION**	**NOTE**
0-1	Not used	Do not change these settings
2	DIS detection number (Echo countermeasure) 0: 1 time 1: 2 times	0: The machine will hang up if it receives the same DIS frame twice. 1: Before sending the DCS, the machine waits for the second DIS, caused by echo on the line.
3–4	Compression modes available in transmit mode Bit 4 3 Mode 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	These bits determine the compression capabilities used in the transmission and declared in phase B (handshaking) of T.30 protocol.
5–6	Compression modes available in receive mode Bit 4 3 Mode 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	These bits determine the compression capabilities declared in phase B (handshaking) of T.30 protocol.
7	Machine initialization 0: Off 1: On	When this bit is set to 1, the same procedure as RAM CLEAR 2 starts immediately.

S01: SwServ 01 (Service Switch 01)		
No	**FUNCTION**	**NOTE**
0–3	Initial RX modem rate Bit 3 2 1 0 Setting (BPS) 0 0 0 0 2.4 k 0 0 0 1 4.8 k 0 0 1 0 7.2 k 0 0 1 1 9.6 k 0 1 0 0 12.0 k 0 1 0 1 14.4 k Other settings – Not used	These bit settings inform the transmitting terminal of the available modem rate for the receiving machine. Use a lower setting if high speeds pose problems during reception.
4-7	Initial TX modem rate Bit 3 2 1 0 Setting (BPS) 0 0 0 0 2.4 k 0 0 0 1 4.8 k 0 0 1 0 7.2 k 0 0 1 1 9.6 k 0 1 0 0 12.0 k 0 1 0 1 14.4 k Other settings – Not used	These bits set the initial modem rate for transmission. If slow transmission (4800 bps) is enabled, these settings are ignored.

S02: SwServ 02 (Service Switch 02)		
No	**FUNCTION**	**NOTE**
0-1	PABX cable equalizer (RX mode) Bit 1 Bit 0 Setting 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs: • Communication error • Modem rate fallback occurs frequently.
2-3	PABX cable equalizer (TX mode) Bit 3 Bit 2 Setting 0 0 None 0 1 Low 1 0 Medium 1 1 High	
4-5	PSTN cable equalizer (RX mode) Bit 5 Bit 4 Setting 0 0 None 0 1 Low 1 0 Medium 1 1 High	
6-7	PSTN cable equalizer (TX mode) Bit 7 Bit 6 Setting 0 0 None 0 1 Low 1 0 Medium 1 1 High	

S03: SwServ 03 (Service Switch 03)		
No	**FUNCTION**	**NOTE**
0	On-hook dialing 0: Disabled 1: Enabled	0: On-hook dial is disabled Default: Disabled (except Germany)
1	Dialing on the ten-key pad when the handset is off hook 0: Disable 1: Enable	1: The user can dial on the ten-key pad when the handset is off hook. Default: Enabled (except Germany and Israel)
2	Not used	Do not change this setting.
3-4	Printing method for error lines Bit 4 Bit 3 Setting 0 0 Print always 0 1 Print blank 1 0 Skip line 1 1 Not used	Lines that encountered transmission errors are printed in the manner specified by this bit setting. (0,0) – Print always: The error line is printed all black. The bad line is shown as a horizontal line. (0,1) – Print blank: The error line is printed all white. The bad line is shown as a horizontal white line. (1,0) – Skip: The error line is not printed. The received image is shortened if there are many error lines. Default: Skip line

S03: SwServ 03 (Service Switch 03)		
No	**FUNCTION**	**NOTE**
5	Acceptable total error lines or ratio 0: 57 lines or 5% 1: 114 lines or 10%	If the error line ratio of a page exceeds the acceptable ratio, RTN will be sent to the other end. This bit is ignored if ECM is in use. Default: 57 lines or 5%
6	Counting method for error lines 0: Number 1: Percent	Default: Percent
7	Reconstruction time for the first line in receive mode 0: 6 s 1: 12 s	When the sending terminal is controlled by a computer, there may be a delay in receiving page data after the local machine accepts set-up data and sends CFR. If this occurs, set this bit to 1 to give the sending machine more time to send data. Default: 6 s

S04: SwServ 04 (Service Switch 04)		
No	**FUNCTION**	**NOTE**
0-7	Start data writing timing	00(H) to FF(H) Unit = 0.1 mm [4 mils] Default: 50(H) (8 mm) [0.31"]s

S05: SwServ 05 (Service Switch 05)		
No	**FUNCTION**	**NOTE**
0-7	ADF no-feed detection time (Jam check)	00(H) to FF(H) unit = 1 second Default: 02(H) (2 seconds)

S06: SwServ 06 (Service Switch 06)		
No	**FUNCTION**	**NOTE**
0-7	Reading start timing for scanning a document in ADF mode—count starts when the leading edge of the document passes the ADF registration sensor.	68(H) to 98(H) Unit = 1 step (0.085 mm) [3.4 mils] Default: 80(H) (10.88 mm) [0.43"]

S07: SwServ 07 (Service Switch 07)		
No	**FUNCTION**	**NOTE**
0-7	Reading end timing for scanning a document in ADF mode—count starts when the trailing edge of the document passes the ADF registration sensor.	68(H) to 98(H) Unit = 1 step (0.085 mm) [3.4 mils] Default: 80(H) (10.88 mm) [0.43"]

S08: SwServ 08 (Service Switch 08)		
No	**FUNCTION**	**NOTE**
0-7	Reading start point for horizontal scanning in ADF mode	00(H) to FF(H) Unit = 1 dot (0.085 mm) [3.4 mils] Default: 84(H) (11.2 mm) [0.44"] **G027 only**

S09: SwServ 09 (Service Switch 09)		
No	**FUNCTION**	**NOTE**
0-7	Not used	Do not change these settings

S0A: SwServ 0A (Service Switch 0A)		
No	**FUNCTION**	**NOTE**
0-7	Reading start timing for scanning a document in flatbed mode—count starts when the CCD unit leaves the home position.	51(H) to AF(H) Unit = 1 step (0.042 mm) [1.7 mils] Default: 80(H) (5.43 mm) [0.21"] This setting takes effect from the next power on. **G027 only**

S0B: SwServ 0B (Service Switch 0B)		
No	**FUNCTION**	**NOTE**
0-7	CCD unit stop position in ADF copy mode	51(H) to AF(H), Unit = 1 step (0.042 mm) [1.7 mils] Default: 80(H) (5.43 mm) (0.21") This setting takes effect from the next power on. **G027 only**

S0C: SwServ 0C (Service Switch 0C)		
No	**FUNCTION**	**NOTE**
0-7	Not used	Do not change these settings

S0D: SwServ 0D (Service Switch 0D)		
No	**FUNCTION**	**NOTE**
0-7	Shading end point in flatbed mode	68(H) to AF(H) Unit = 1 step (0.042 mm) [1.7 mils] Default: 80(H) (5.43 mm) [0.21"] This setting takes effect from the next power on. **G027 only**

S0E: SwServ 0E (Service Switch 0E)		
No	**FUNCTION**	**NOTE**
0-7	Not used	Do not change these settings

S0F: SwServ 0F (Service Switch 0F)		
No	**FUNCTION**	**NOTE**
0-7	Reading start point for horizontal scanning in flatbed mode	00(H) to FF(H) Unit = 1 dot (0.085 mm) [3.4 mils] Default: 84(H) (11.2 mm) [0.44"] This setting takes effect from the next power on. **G027 only**

S10: SwServ 10 (Service Switch 10)		
No	**FUNCTION**	**NOTE**
0–7	Not used	Do not change these settings

4.3.5 COUNTRY SWITCH PARAMETERS (SWCNTRY)

C00: SwCntry 00 (Country Switch 00)		
No	**FUNCTION**	**NOTE**
0-4	Not used	Do not change these settings
5–6	Maximum allowable carrier drop during image data reception Bit 6 Bit 5 Value (ms) 0 0 260 0 1 460 1 0 860 1 1 Not used	These bits set the acceptable modem carrier drop time. Default: 260 ms
7	Polarity change detection after DIS detection 0: Off 1: On	Default: Off

C01: SwCntry 01 (Country Switch 01)		
No	**FUNCTION**	**NOTE**
0	Emergency calls using 999 0: Enabled 1: Disabled	If this bit is at 1, the machine will not allow you to dial 999 on the auto-dialer. Default: Enabled
1	Operator call if no response is received in reply to DIS 0: Disabled 1: Enabled	Set this bit to 1 if the user expects to receive telephone calls at the same number that the machine is connected to. The machine will then alert the user if a phone call comes in. Default: Disabled
2	PTT requirements: France 0: Off 1: On	
3	Not used	Do not change this setting.
4	When bit 1 is 0, DCN is sent and the line is disconnected. 0: Off 1:On	Default: Off (except Germany and Italy)
5	Protocol requirements: Germany 0: Off 1: On	
6	Protocol requirements: Spain 0: Off 1: On	
7	Protocol requirements: Europe 0: Off 1: On	Default: Off (except Europe)

C02: SwCntry 02 (Country Switch 02)		
No	**FUNCTION**	**NOTE**
0	PSTN access method programming (Function 12) 0: Disabled 1: Enabled	0: PSTN access method can be programmed in Function 12 (Dialing Mode). Default: Enabled (except U.S.A.)
1–2	Date display type Bit 2 Bit 1 Setting 0 0 Europe 0 1 USA 1 0 Japan 1 1 Not used	Europe: 15 APR 1999 11:55 USA: APR 15 1999 11:55 Japan: 1999-4-15 11:55 Default: Depends on the country number.
3	Time display 0: 12 hours 1: 24 hours	Default: 24 hours (except U.S.A.)
4–5	Pulse dialing method Bit 5 Bit 4 Setting 0 0 Normal (P=N) 0 1 Oslo (P=10–N) 1 0 Sweden (P=N+1) 1 1 Not used	P: Number of pulses sent out N: Number dialed Default: Normal
6	Telephone line type programming level 0: User level 1: Service level	1: Only a service function can program the telephone line type selection (the user cannot see user function 12). Default: User level
7	CSI programming level 0: User level 1: Service level	1: Only a service function can program the CSI (the user cannot see user function 17). Default: User level (except Ireland and Portugal)

C03: SwCntry 03 (Country Switch 03)		
No	**FUNCTION**	**NOTE**
0-5	Country code 5 4 3 2 1 0 Country 0 0 0 0 0 0 00(H) France 0 0 0 0 0 1 01(H) Germany 0 0 0 0 1 0 02(H) U. K. 0 0 0 0 1 1 03(H) Italy 0 0 0 1 0 0 04(H) Austria 0 0 0 1 0 1 05(H) Belgium 0 0 0 1 1 0 06(H) Denmark 0 0 0 1 1 1 07(H) Finland 0 0 1 0 0 0 08(H) Ireland 0 0 1 0 0 1 09(H) Norway 0 0 1 0 1 0 0A(H) Sweden 0 0 1 0 1 1 0B(H) Switzerland 0 0 1 1 0 0 0C(H) Portugal 0 0 1 1 0 1 0D(H) Netherlands 0 0 1 1 1 0 0E(H) Spain 0 0 1 1 1 1 0F(H) Israel 0 1 0 0 0 0 10(H) Canada 0 1 0 0 0 1 11(H) U. S. A. 0 1 0 0 1 0 12(H) Asia 0 1 0 0 1 1 13(H) Japan 0 1 0 1 0 0 14(H) Hong Kong 0 1 0 1 0 1 15(H) South Africa 0 1 0 1 1 0 16(H) Australia 0 1 0 1 1 1 17(H) New Zealand 0 1 1 0 0 0 18(H) Singapore 0 1 1 0 0 1 19(H) Malaysia 0 1 1 0 1 0 1A(H) China 0 1 1 0 1 1 1B(H) Taiwan 0 1 1 1 0 0 1C(H) Not used 0 1 1 1 0 1 1D(H) Not used 0 1 1 1 1 0 1E(H) Not used 0 1 1 1 1 1 1F(H) Not used 1 0 0 0 0 0 20(H) Turkey 1 0 0 0 0 1 21(H) Greece	This parameter is an alternate method to parameter CC for entering the country code. Both methods change the same memory location. Note: This parameter is a little different from the Country Code CC. The country Code CC minus 1 is equal to this parameter. When the country code is changed, the machine reverts to the default language and paper size settings for the country selected.
6-7	Not used	Do not change these settings

C04: SwCntry 04 (Country Switch 04)		
No	**FUNCTION**	**NOTE**
0-1	Paper size group selection for the upper tray Bit 1 Bit 0 Group 0 0 Europe/Asia 0 1 U. S. A. 1 0 Japan 1 1 Not used	The following paper sizes can be selected Europe/Asia: Paper width >= 203 mm A4 → A5 landscape → 8¼ x 13 → Letter (8½ x 11) → 8 ½ x 5 ½ → 8½ x 13 → 8 x 10½ → Legal (8½ x 14) → return to A4 Paper width < 203 mm A5 portrait → C5 Env → C6 Env →DL Env → return to A5 portrait USA: Paper width >= 203 mm Same as Europe/Asia Paper width < 203 mm 5½ x 8½ → Exec (7¼ x 10½) → Com 10 (4 1/8 x 9½) → Mon. (3 7/8 x 7½) → return to 5½ x 8½ Japan: Paper width >= 203 mm Same as Europe/Asia Paper width < 203 mm A5 portrait → B5 portrait →Post Card → return to A5 portrait
2	Dialing requirements : Switzerland 0: Off 1: On	Default values are dependant on the Country Code.
3	Dialing requirements : France 0: Off 1: On	
4	Dialing requirements : Denmark 0: Off 1: On	
5	Dialing requirements : Norway 0: Off 1: On	
6	Dialing requirements : Austria 0: Off 1: On	
7	Dialing requirements : Germany 0: Off 1: On	

C05: SwCntry 05 (Country Switch 05)		
No	**FUNCTION**	**NOTE**
0	DCN transmission when T1 time runs out during dialing 0: Off 1: On	Default: Off (except Europe)
1	Line off when an echo frame is received 0: Disable 1: Enable	Default: Disable (except German)
2	CED transmission time 0: 2.7 seconds 1: 3.1 seconds	Default: 2.7 seconds (except Denmark and Australia)

C05: SwCntry 05 (Country Switch 05)		
No	**FUNCTION**	**NOTE**
3	Training count at the same rate 0: 1 time 1: 2 times	Default: 1 time (except France)
4	Time between dialing completion and sending the first CNG 0: 3 seconds 1: 0.5 seconds	Default: 3 seconds (except Europe)
5	Sending all spaces when the CSI is not entered 0: Disable 1: Enable	Default: Disable (except France and Germany)
6	Modem rate used for the next page after receiving a negative code (RTN or PIN 0: No change 1: Fallback	Default: No change (except France)
7	CED transmission disabling 0: Enable 1: Disable	Default: Enable (except China)

C06: SwCntry 06 (Country Switch 06)		
Bit No.	**FUNCTION**	**NOTE**
0 - 7	Minimum interval between automatic dialing attempts	08(H) to FF(H) Unit = 2 seconds Default: 06(H) (12 seconds)

C07: SwCntry 07 (Country Switch 07)		
Bit No.	**FUNCTION**	**NOTE**
0 - 7	Not used	Do not change this setting.

C08: SwCntry 08 (Country Switch 08)		
Bit No.	**FUNCTION**	**NOTE**
0 - 7	Maximum number of redials for immediate transmission	01(H) to 0E(H) Unit = 1 time Default: Dependant on the country number setting

C09: SwCntry 09 (Country Switch 09)		
Bit No.	**FUNCTION**	**NOTE**
0 - 7	Not used	Do not change this setting.

C0A: SwCntry 0A (Country Switch 0A)		
Bit No.	**FUNCTION**	**NOTE**
0 - 7	Interval between dialing attempts to the same destination for immediate transmission	01(H) to 06(H) Unit = 1 minute Default: Dependant on the country number setting

4.4 NCU PARAMETERS

⚠CAUTION

Do not adjust parameters labeled "Not used", as this may cause the machine to malfunction. Such bits are only for use in other regions, such as Japan.

⚠CAUTION

Do not turn off the power when the LCD displays "Please wait" or "Registered".

The following tables give the RAM addresses and the parameter calculation units that the machine uses for ringing signal detection and automatic dialing.

Address	Function	Unit	Remarks
0F3C	Auto dial prohibition after a certain number of failed attempts (for Germany)	Bit 0–3: Number of failed attempts (default is 12 for Germany) Bit 4: Not used Bit 5 1: Enabled This bit is set automatically if SwCntry 04 bit 7 (Dialing requirements for Germany) is 1 Bit 6-7: Not used	
0F3D	Auto redial prohibition after a certain number of failed attempts (for France)	Bit 0–3: Number of failed attempts (default is 6 for France) Bit 4: Not used Bit 5 1: Enabled This bit is set automatically if SwCntry 04 bit 3 (Dialing requirements for France) is 1 Bit 6-7: Not used	
0F3E	PSTN dial tone required	0: Disabled 1: Enabled	
0F3F	PSTN dial tone 1 frequency	10 Hz	Range: 0 to 1200 Hz
0F40	PSTN dial tone 1 bandwidth	Hz	Range: 0 to 400 Hz
0F41	PSTN dial tone 2 frequency	10 Hz	Range: 0 to 1200 Hz
0F42	PSTN dial tone 2 bandwidth	Hz	Range: 0 to 400 Hz
0F43	PSTN dial tone threshold	0.5 dB (Signed values) Note 1 Range: -50 to 3 dB	
0F44	PSTN dial tone detect time	20 ms	Range: 400 to 4900 ms
0F45	PSTN dial tone minimum on time	10 ms	Range: 0 to 2000 ms
0F46	PSTN dial tone maximum on time		
0F47	PSTN dial tone minimum off time		
0F48	PSTN dial tone maximum off time		
0F49	PSTN dial tone maximum dropout time	ms	Range: 0 to 200 ms
0F4A	PSTN dial tone detect time out	500 ms	Range: 0 to 60 s
0F4B	PSTN dial tone inter digit detect time out		

Address	Function	Unit	Remarks
0F4C	PABX dial tone required	0: Disabled 1: Enabled	
0F4D	PABX dial tone 1 frequency	10 Hz	Range: 0 to 1200 Hz
0F4E	PABX dial tone 1 bandwidth	Hz	Range: 0 to 400 Hz
0F4F	PABX dial tone 2 frequency	10 Hz	Range: 0 to 1200 Hz
0F50	PABX dial tone 2 bandwidth	Hz	Range: 0 to 400 Hz
0F51	PABX dial tone threshold	0.5 dB (Signed values) Note 1 Range: -50 to 3 dB	
0F52	PABX dial tone detect time	20 ms	Range: 400 to 4900 ms
0F53	PABX dial tone minimum on time	10 ms	Range: 0 to 2000 ms
0F54	PABX dial tone maximum on time		
0F55	PABX dial tone minimum off time		
0F56	PABX dial tone maximum off time		
0F57	PABX dial tone maximum dropout time	ms	Range: 0 to 2000 ms
0F58	PABX dial tone detect time out	500 ms	Range: 0 to 60 s
0F59	PABX dial tone inter digit detect time out		
0F5A	International dial tone required	0: Disabled 1: Enabled	
0F5B	International dial tone 1 frequency	10 Hz	Range: 0 to 1200 Hz
0F5C	International dial tone 1 bandwidth	Hz	Range: 0 to 400 Hz
0F5D	International dial tone 2 frequency	10 Hz	Range: 0 to 1200 Hz
0F5E	International dial tone 2 bandwidth	Hz	Range: 0 to 400 Hz
0F5F	International dial tone threshold	0.5 dB (Signed values) Note 1 Range: -50 to 3 dB	
0F60	International dial tone detect time	20 ms	Range: 400 to 4900 ms
0F61	International dial tone minimum on time	10 ms	Range: 0 to 2000 ms
0F62	International dial tone maximum on time		
0F63	International dial tone minimum off time		
0F64	International dial tone maximum off time		
0F65	International dial tone maximum dropout time	ms	Range: 0 to 2000 ms
0F66	International dial tone detect time out	500 ms	Range: 0 to 60 s
0F67	International dial tone inter digit detect time out		
0F68	PSTN busy tone 1 frequency	10 Hz	Range: 0 to 1000 Hz
0F69	PSTN busy tone 1 bandwidth	Hz	Range: 0 to 250 Hz
0F6A	PSTN busy tone 2 frequency	10 Hz	Range: 0 to 1000 Hz
0F6B	PSTN busy tone 2 bandwidth	Hz	Range: 0 to 250 Hz
0F6C	PSTN busy tone threshold	0.5 dB (Signed values) Note 1 Range: -50 to 3 dB	
0F6D	PSTN busy tone detect time	100 ms	Range: 0.5 to 10 s
0F6E	PSTN busy tone minimum on time	10 ms	Range: 0 to 2000 ms
0F6F	PSTN busy tone maximum on time		
0F70	PSTN busy tone minimum off time		
0F71	PSTN busy tone maximum off time		
0F72	PSTN busy tone maximum dropout time	ms	Range: 0 to 200 ms
0F73	PSTN busy tone detect time out	500 ms	Range: 0 to 60 s
0F74	PABX busy tone 1 frequency	10 Hz	Range: 0 to 1000 Hz
0F75	PABX busy tone 1 bandwidth	Hz	Range: 0 to 250 Hz

Address	Function	Unit	Remarks
0F76	PABX busy tone 2 frequency	10 Hz	Range: 0 to 1000 Hz
0F77	PABX busy tone 2 bandwidth	Hz	Range: 0 to 250 Hz
0F78	PABX busy tone threshold	0.5 dB (Signed values) Note 1 Range: -50 to 3 dB	
0F79	PABX busy tone detect time	100 ms	Range: 0.5 to 10 s
0F7A	PABX busy tone minimum on time	10 ms	Range: 0 to 2000 ms
0F7B	PABX busy tone maximum on time		
0F7C	PABX busy tone minimum off time		
0F7D	PABX busy tone maximum off time		
0F7E	PABX busy tone maximum dropout time	ms	Range: 0 to 200 ms
0F7F	PABX busy tone detect time out	500 ms	Range: 0 to 60 s
0F80	International busy tone 1 frequency	10 Hz	Range: 0 to 1000 Hz
0F81	International busy tone 1 bandwidth	Hz	Range: 0 to 250 Hz
0F82	International busy tone 2 frequency	10 Hz	Range: 0 to 1000 Hz
0F83	International busy tone 2 bandwidth	Hz	Range: 0 to 250 Hz
0F84	International busy tone threshold	0.5 dB (Signed values) Note 1 Range: -50 to 3 dB	
0F85	International busy tone detect time	100 ms	Range: 0.5 to 10 s
0F86	International busy tone minimum on time	10 ms	Range: 0 to 2000 ms
0F87	International busy tone maximum on time		
0F88	International busy tone minimum off time		
0F89	International busy tone maximum off time		
0F8A	International busy tone maximum dropout time	ms	Range: 0 to 200 ms
0F8B	International busy tone detect time out	500 ms	Range: 0 to 60 s
0F8C	Ringing minimum on time	20 ms	Range: 20 to 4000 ms
0F8D	Ringing maximum on time	100 ms	Range: 1 to 10 s
0F8E	Ringing minimum off time	20 ms	Range: 200 to 4000 ms
0F8F	Ringing maximum off time	100 ms	Range: 1 to 10 s
0F90	Ringing minimum on time	20 ms	Range: 0 to 1000 ms
0F91	Ringing minimum off time		
0F92	Ring minimum frequency	Hz	Range: 0 to 100 Hz
0F93	Ring maximum frequency		
0F94	Not used		Do not change these settings
0F95			
0F96			
0F97	Remote active inter digit timeout	50 ms	Range: 50 to 6000 ms
0F98 to 0FA1	Not used		Do not change these settings
0FA2	Connections	Bit 0 1: PABX dial tone detected (If the PABX access is set with user function 12 to Dial mode, this bit is set to 1 automatically.) Bit 1 1: International dial tone detected	

Address	Function	Unit	Remarks
0FA3	International access number 1 (1st digit)	ASCII	There can be up to four international access numbers. Example: For codes of "001" and "0041" 0FA3: 30H ("0") 0FA4: 30H ("0") 0FA5: 31H ("1") 0FA6: 00H (not used) 0FA7: 30H ("0") 0FA8: 30H ("0") 0FA9: 34H ("4") 0FAA: 31H ("1")
0FA4	International access number 1 (2nd digit)		
0FA5	International access number 1 (3rd digit)		
0FA6	International access number 1 (4th digit)		
0FA7	International access number 2 (1st digit)		
0FA8	International access number 2 (2nd digit)		
0FA9	International access number 2 (3rd digit)		
0FAA	International access number 2 (4th digit)		
0FAB	International access number 3 (1st digit)		
0FAC	International access number 3 (2nd digit)		
0FAD	International access number 3 (3rd digit)		
0FAE	International access number 3 (4th digit)		
0FAF	International access number 4 (1st digit)		
0FB0	International access number 4 (2nd digit)		
0FB1	International access number 4 (3rd digit)		
0FB2	International access number 4 (4th digit)		
0FB3	DTMF tone duration	ms	Range: 50 to 200 ms
0FB4	DTMF gap duration		
0FB5	DTMF high frequency tone level	0.5 dB (Signed values) Note 1 Range: -50 to 3 dB	
0FB6	DTMF low frequency tone level		
0FB7	Pulse make time	ms	Range: 0 to 100 ms
0FB8	Pulse break time		
0FB9	Pulse gap time	10 ms	Range: 0.5 to 2 s
0FBA	Time between opening or closing the DO relay and opening the OHDI relay	2 ms	Range: 0 to 500 ms
0FBB	Time between final OHDI relay closure and DO relay opening or closing		
0FBC	PSTN pre dial pause time	50 ms	Range: 0 to 10 s
0FBD	PABX pre dial pause time		
0FBE	International pre dial pause time		
0FBF	Minimum pause between dialed digits (pulse dial mode)	20 ms	Range: 0 to 4000 ms
0FC0	Interval between dialing the last digit and switching the OHDI relay over to the external telephone when dialing from the operation panel in handset mode	20 ms	Range: 0 to 2000 ms
0FC1	Break time (flash start mode)	10 ms	The OHDI relay is open for this interval. Range: 0 to 500 ms
0FC2	Grounding time (ground start mode)		The Gs relay remains closed for this interval. Range: 0 to 500ms
0FC3	Line current detection	Bit 0 1: Line current is detected Bit 1 1: Line current and polarity change are detected	
0FC4	Line current detection time	10 ms	Range: 0 to 2000 ms
0FC5	Line current drop detect time		
0FC6	Line current wait time	100 ms	Range: 0 to 10 s

Address	Function	Unit	Remarks
0FC7	Modem turn-on level (incoming signal detection level)	0.5 dB (Signed values) Note 1 Range: -50 to 3 dB	
0FC8	Tx level from the modem		
0FC9	1100Hz tone transmission level from the modem		
0FCA	2100Hz tone transmission level from the modem		
0FCB	Modem Tx loss		
0FCC	Modem Rx loss		
0FCD	T0 timer	1 s	Range: 1 to 150 s
0FCE	CED detect time	10 ms	Range: 1 to 2000 ms

NOTE: 1) Signed value: Bit 7 is used as a sign for a plus or minus. Then, 00(H) to 7F(H) mean 0 to 127 and 80(H) to FF(H) mean –128 to –1. A minus value means that the stored value is the Hex value minus 100(H). For example, B5(H) – 100(H) = 181-256 = -75

4.5 SERVICE RAM ADDRESSES

⚠CAUTION

Do not adjust an item labeled "Not used", as this may cause the machine to malfunction. Such bits are only for use in other regions, such as Japan.

⚠CAUTION

Do not turn off the power when the LCD displays "Please wait" or "Registered".

0000 to 0005(H) – Function bit switches (SwFunc)

0006 to 0009(H) – User parameter switches (SwUser)

000A to 001A(H) – Service bit switches (SwServ)

001B to 0025(H) – Country bit switches (SwCntry)

0F3C to 0FCC(H) – NCU parameters

0FE0 to 0FFF(H) – TTI (ASCII)

1000 to 1013(H) – CSI (ASCII)

1014(H) – Power saver mode time 1

1015(H) – Power saver mode time 2

1016(H) – Transmission monitor volume 00 – 02(H)

1017(H) – Reception monitor volume 00 – 02(H)

1018(H) – On-hook monitor volume 00 – 02(H)

1019(H) – Dial monitor volume 00 – 02(H)

101A(H) – Buzzer volume 00 – 02(H)

101B(H) – Ringing volume 00 – 02(H)

101C(H) – Not used

101D to 1044(H) – Redial number

1045 to 1048(H) – Copier counter

Address	High	Low
1045(H)	Hundred millions digit	Ten millions digit
1046(H)	Millions digit	Ten thousands digit
1047(H)	Thousands digit	Hundreds digit
1048(H)	Tens digit	Unit digit

Note: The following counters have the same data format as above.

1049 to 104C(H) – Fax transmission counter

104D to 1050(H) – Fax reception counter

1051 to 1054(H) – PC print counter

1055 to 1058(H) – PC scan counter

1059 to 105C(H) – Total print counter

105D to 371C(H) – Journal log

371D to 3992(H) – Latest 30 error codes (Read only)

One error record consists of 21 bytes of data. The format is as follows:

1st to 11th bytes – Date (ASCII)
12th to 18th bytes – Time (ASCII)
19th to 21st byte – Error code (ASCII)

3993 to 39A7(H) – ROM version (ASCII)

5. PREVENTIVE MAINTENANCE

5.1 MAINTENANCE ITEMS AND METHODS

The G series models do not require preventive maintenance.
However, if the machine is serviced, the following items must be done.

Action Symbol: L: Lubricate I: Inspect C: Clean A: Adjust

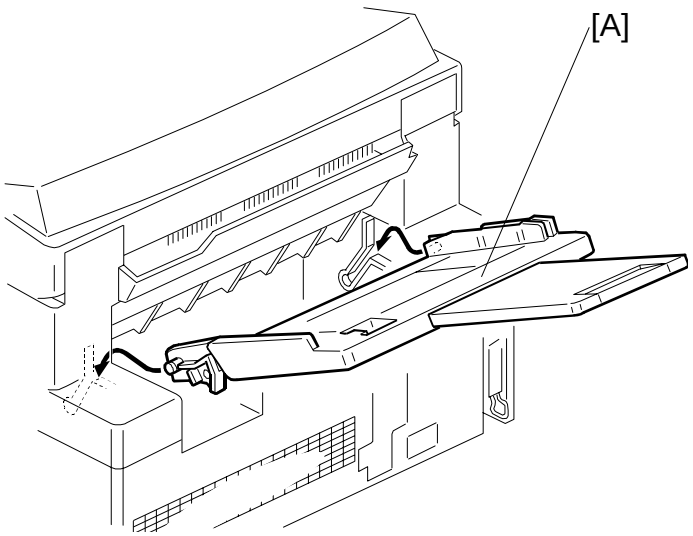
Item	Action	Method
Scanner (Flatbed)		
Platen Cover Sheet	C	Soft cloth dampened with water
Exposure Glass	C	Soft cloth dampened with alcohol or water
CCD Guide Rail	L	Grease - CPL501
Scanner (ADF)		
Separation Tab	C	Soft cloth dampened with water
Pick-up Roller	C	Soft cloth dampened with water
Document Feed Roller	C	Soft cloth dampened with water
Document Feed-in Roller	C	Soft cloth dampened with water
Document Feed-out Roller	C	Soft cloth dampened with water
Document Guide Film	C	Soft cloth dampened with water
Ground contact point of the feed-in roller shaft	L	Grease - KS660
Ground contact point of the feed-out roller shaft	L	Grease - KS660
Paper Feed		
Paper Feed Roller	C	Soft cloth dampened with water
Ground contact point of the paper feed roller shaft	L	Grease - KS660
Transfer Roller		
Transfer Roller	C	Blower Brush (Remove the roller and then blow off adhered toner.)
Fusing		
Cleaning Pad	I	Replace when the toner cassette is changed.
Hot Roller Bushing (Left)	L	Grease – KS660
Gear Train		
Gears	L	Grease - CPL501

6. REPLACEMENT AND ADJUSTMENT

6.1 EXTERIOR

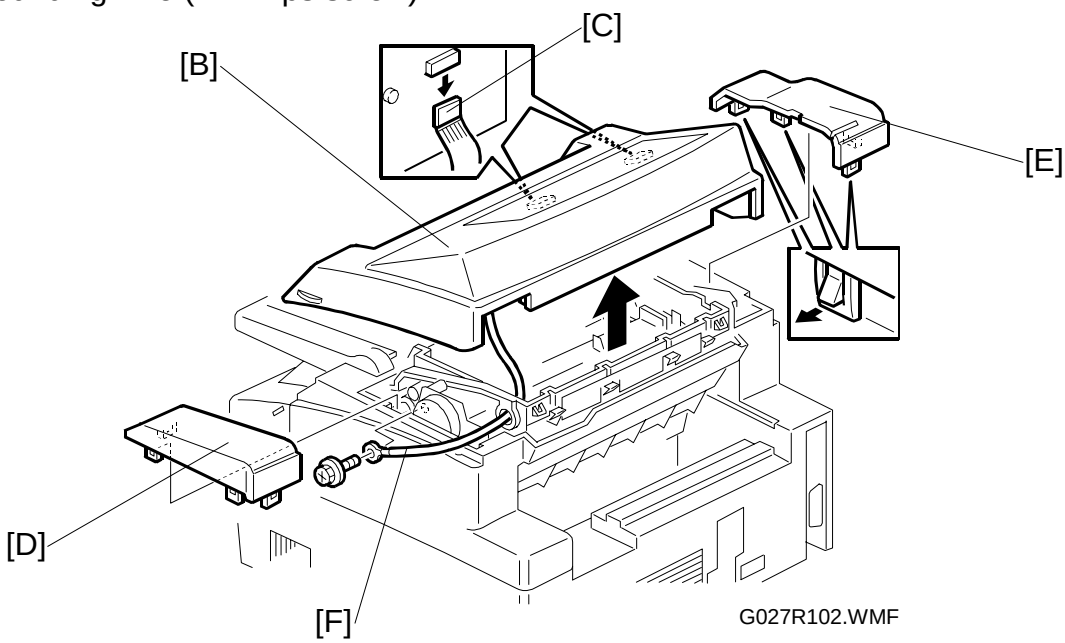
6.1.1 OPERATION PANEL REMOVAL (G025 ONLY)

A: Upper paper tray



G027R100.WMF

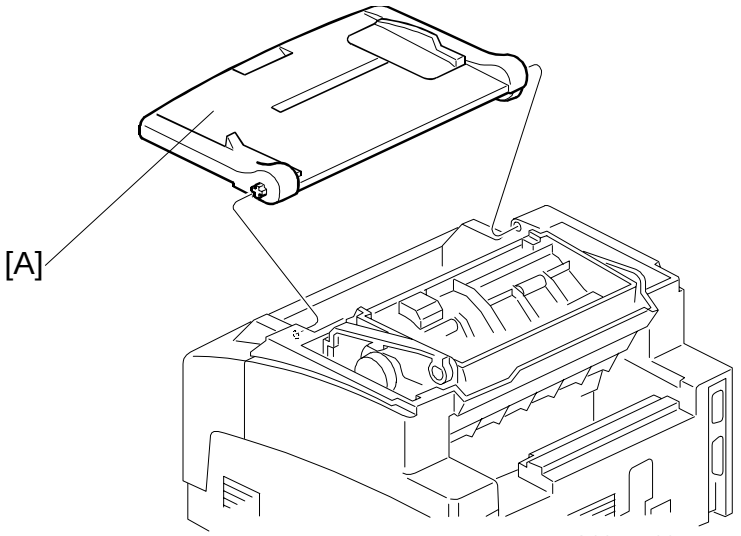
B: Upper cover
C: 2 flat cables
D: ADF right cover (4 hooks)
E: ADF left cover (4 hooks)
F: Grounding wire (1 Philips screw)



G027R102.WMF

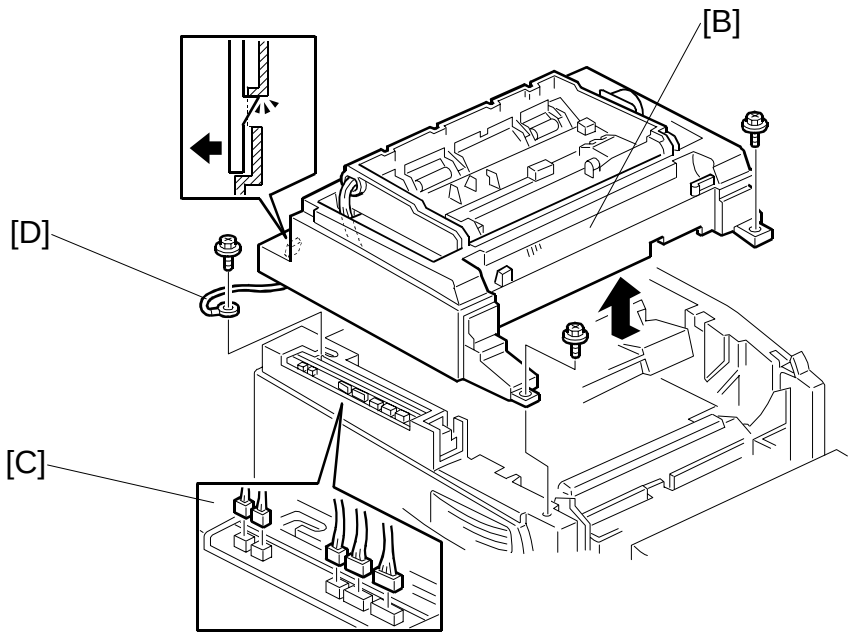
6.1.2 UPPER UNIT REMOVAL (G025 ONLY)

A: Document tray



G027R103.WMF

B: Upper unit (2 tapping screws)
C: 6 connectors
D: Grounding wire (1 Philips screw)

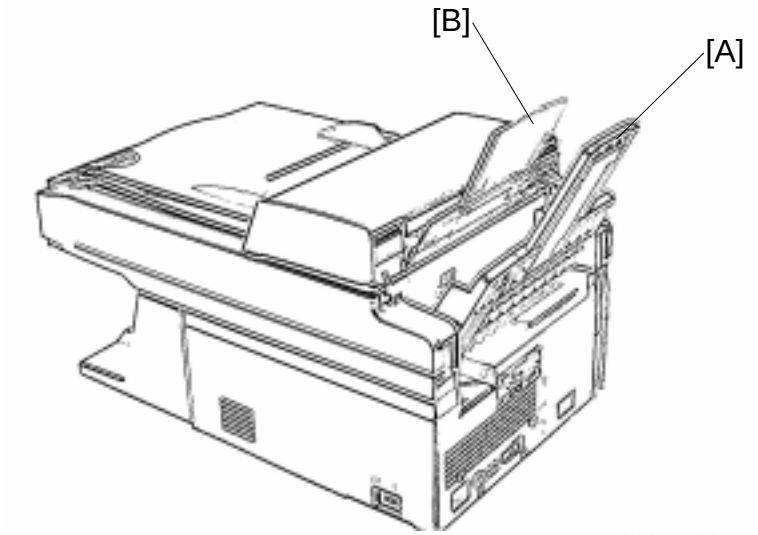


G027R105.WMF

6.1.3 UPPER COVER REMOVAL (G027 ONLY)

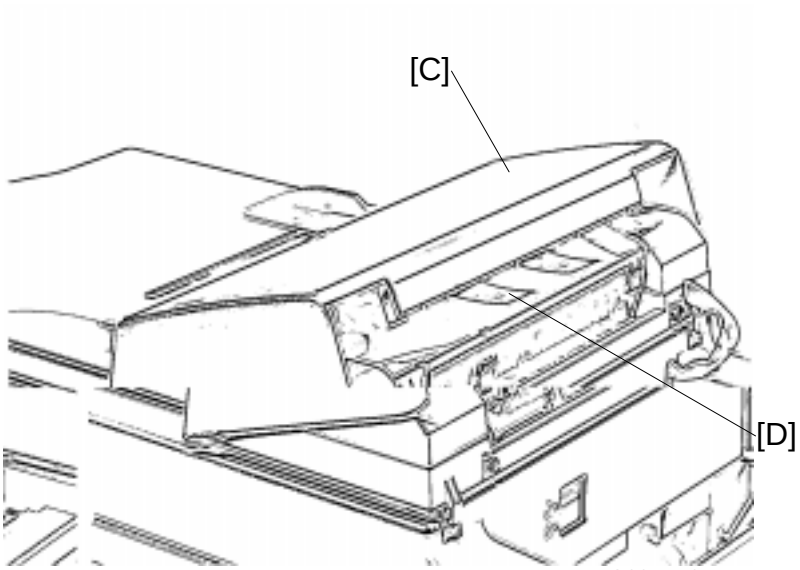
A: Upper paper tray

B: Document exit tray



G027R500.TIF

C: ADF upper cover

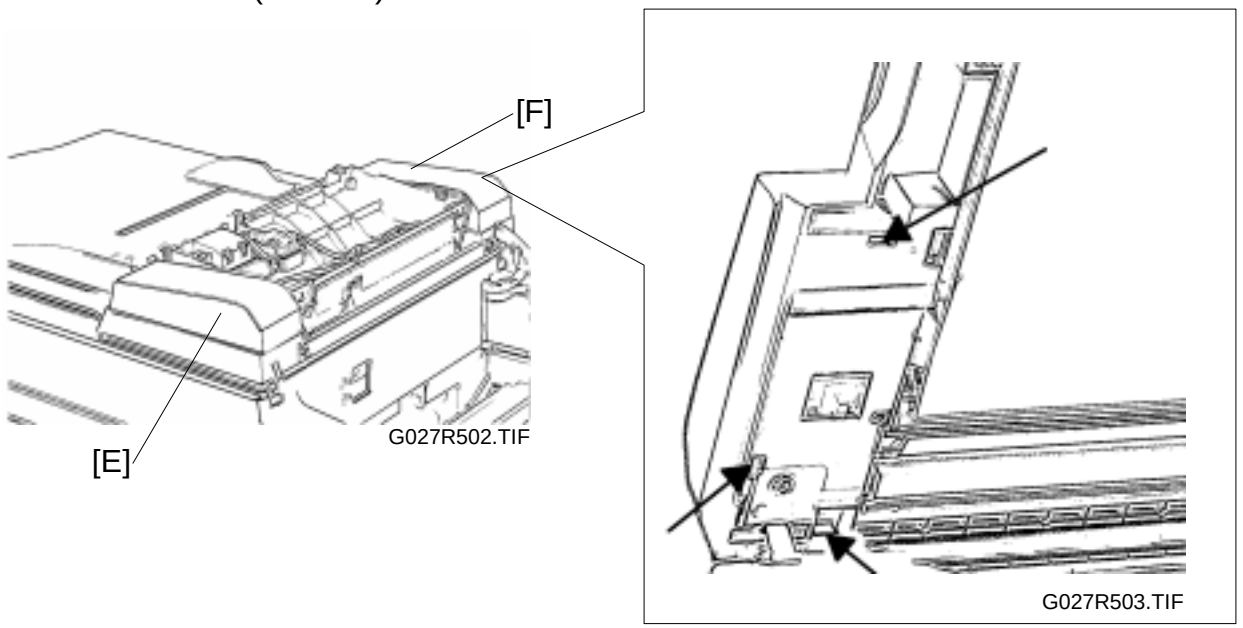


G027R501.TIF

NOTE: Do not damage the mylar [D].

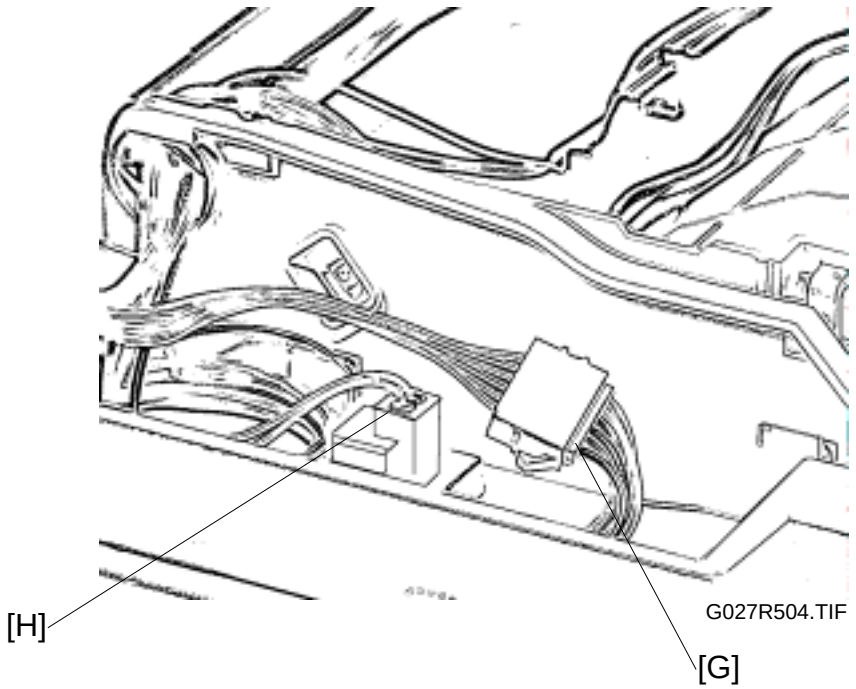
E: ADF right cover (3 hooks)

F: ADF left cover (3 hooks)

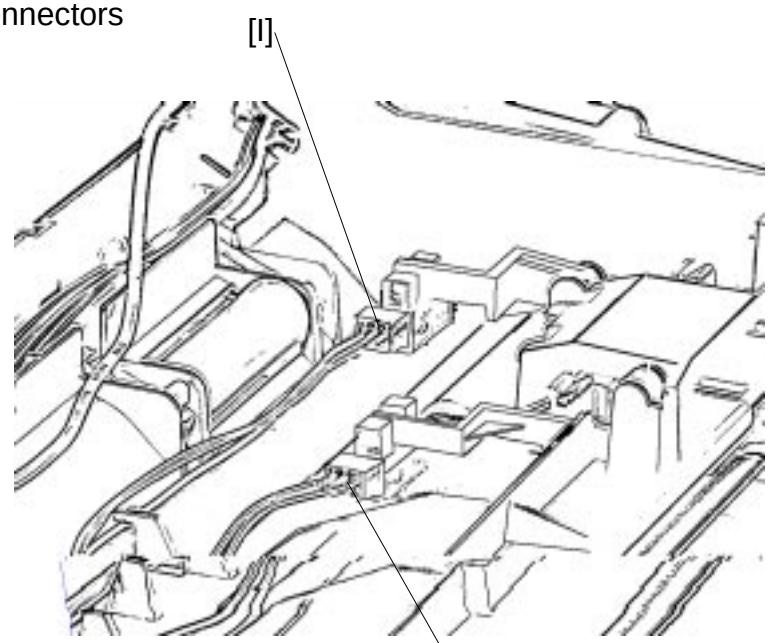


G: Motor connector

H: Platen cover switch connector

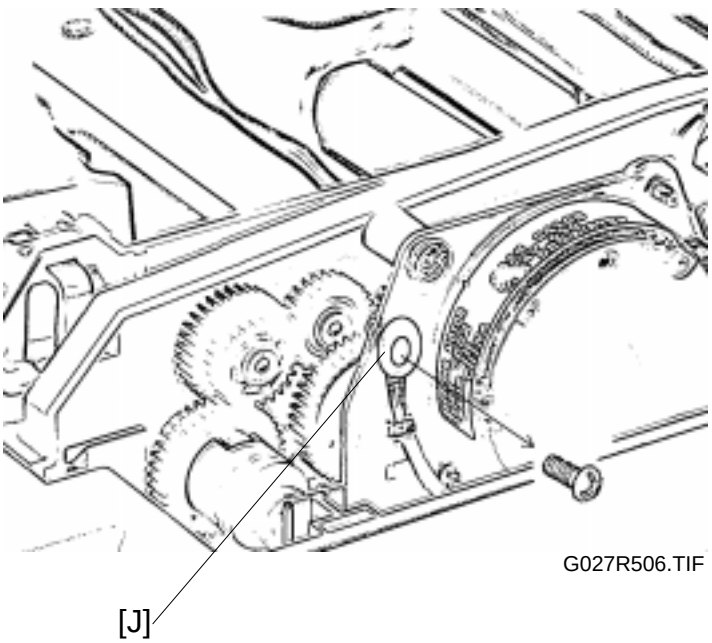


I: 2 sensor connectors



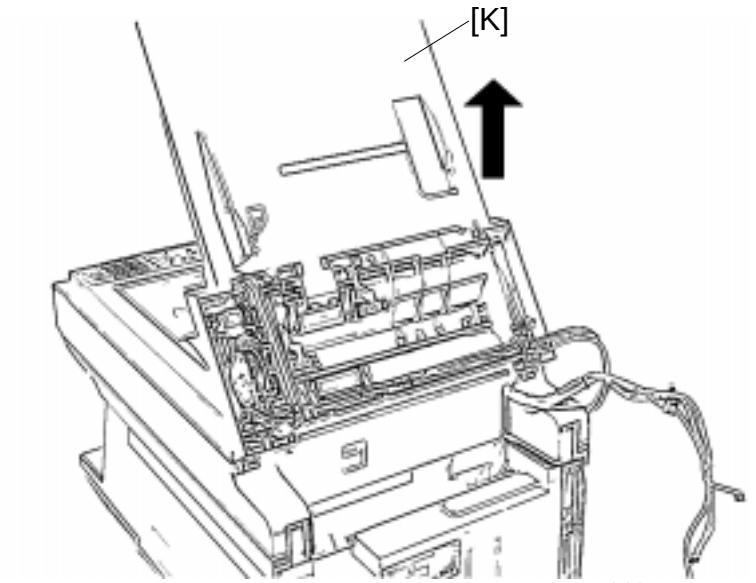
G027R505.TIF

J: Grounding wire (1 Philips screw)



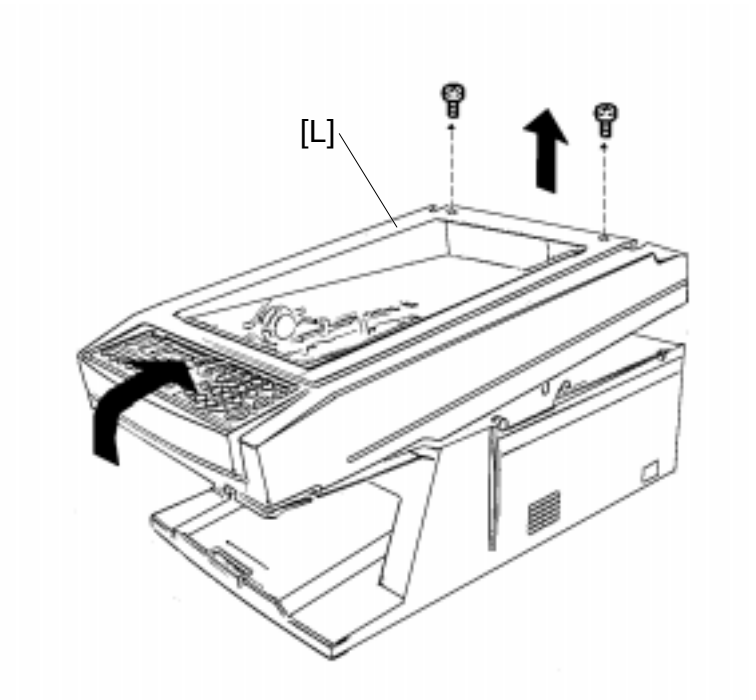
G027R506.TIF

Platen cover unit



G027R507.TIF

K: Upper cover (2 Philips screws)



G027R508.TIF

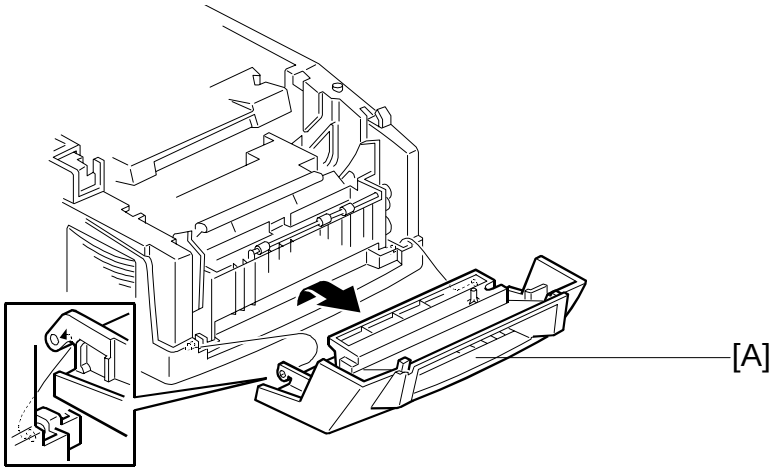
6.1.4 RIGHT COVER REMOVAL

G025

Preparation

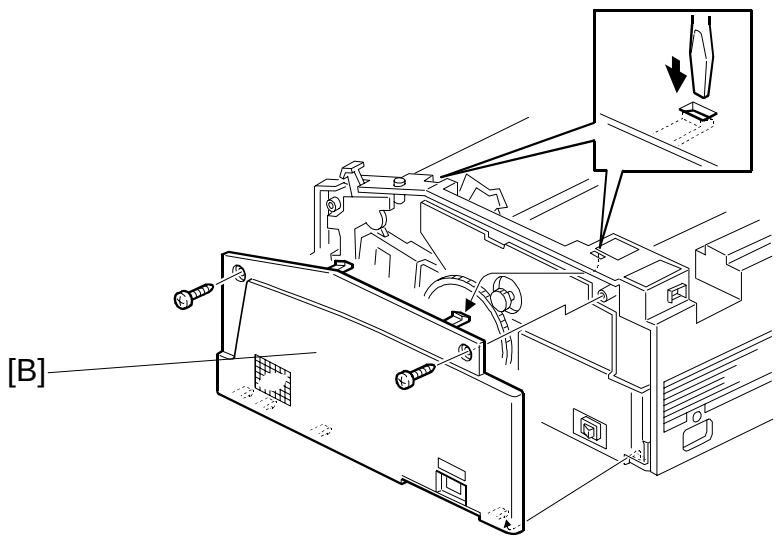
1) Remove the upper unit. (See Upper Unit Removal.)

A: Front cover



G027R107.WMF

B: Right cover (2 tapping screws and 7 hooks)



G027R108.WMF

NOTE: To remove the right cover, unhook the upper 2 hooks after removing the 2 tapping screws. Then pull the right cover off gently.

NOTE: The right cover holds the interlock switch actuator and drive gears in position. They can slip off easily when the right cover has been removed.

Reinstallation

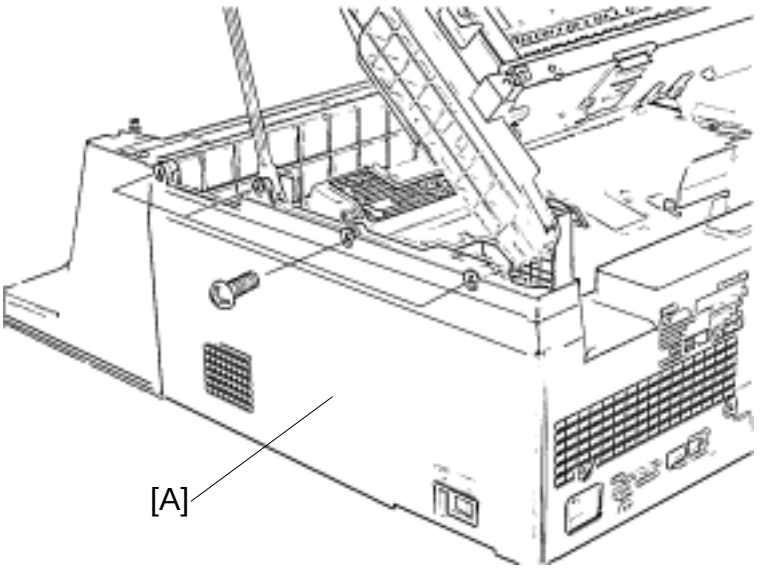
Make sure the right cover does not pinch the cable.

G027

Preparation

1) Remove the upper cover. (See Upper Cover Removal.)
2) Open the upper unit.

A: Right cover (4 tapping screws and 6 hooks)



G027R510.TIF

CAUTION: Do not close the upper unit when the right cover has been removed. Otherwise, the lower ring of the gas spring may suddenly slip off the anchor post and possibly cause injury and damage to the frame

NOTE: The right cover holds the interlock switch actuator, gas spring, and drive gears in position. They can slip off easily when the right cover is off.

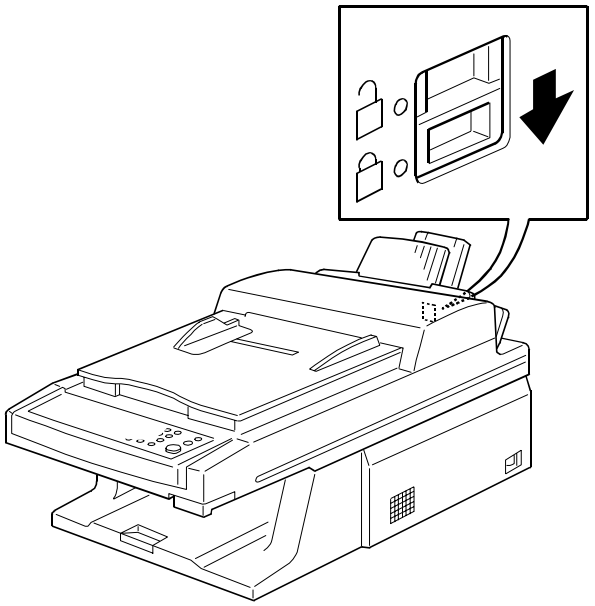
Reinstallation

Make sure the right cover does not pinch the cable.

6.1.5 UPPER UNIT REMOVAL (G027 ONLY)

Preparation

1) Set the CCD unit lock lever to the lock position as shown in the diagram.
2) Remove the upper cover. (See Upper Cover Removal.)
3) Open the upper unit.

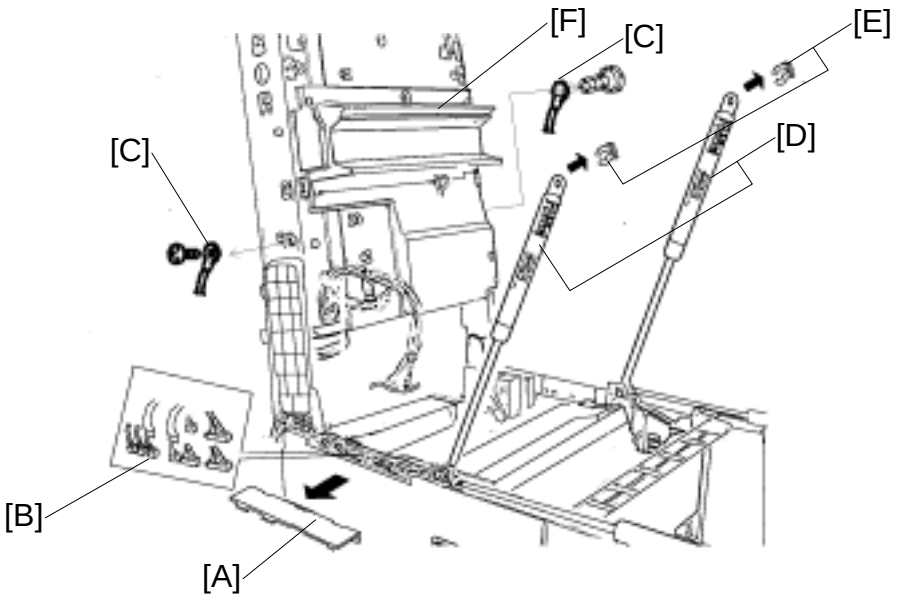


G027R500.WMF

A: Cable cover (3 hooks)

B: 2 flat cables and 8 connectors

C: 2 Grounding wires (2 Philips screws)



G027R512.TIF

D: 2 gas springs
E: 2 snap rings

⚠WARNING

1. **Do not release the gas springs from their anchor posts while the upper unit is closed. Otherwise, they will expand suddenly and may cause injury.**
2. **When the gas springs are removed, hold the upper unit to prevent it from falling.**

Turn the upper unit perpendicular (90º) to remove it.

CAUTION: Do not leave the upper unit fully opened. Otherwise, the upper unit or whole machine may fall over and become damaged.

Do not damage the mylar [F].

Reinstallation

NOTE: 1) Make sure the gas springs are oriented as shown in the diagram.
2) Make sure to unlock the CCD lock lever.

6.2 OPTICS

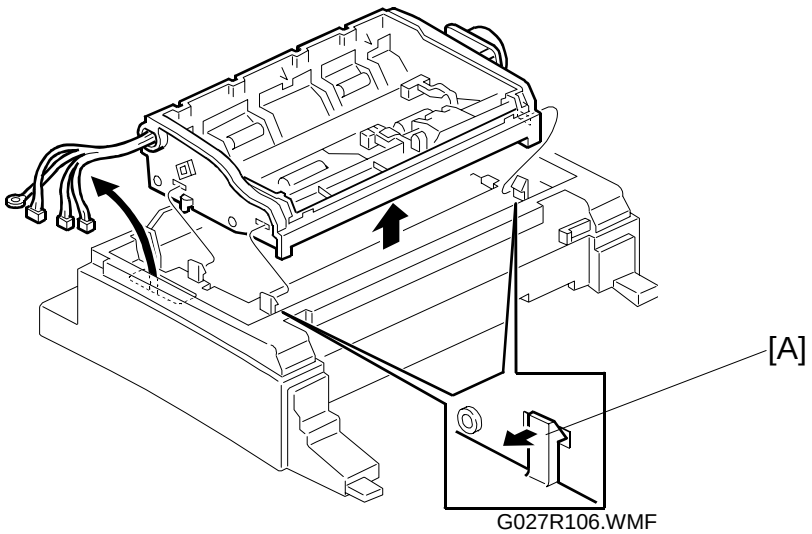
6.2.1 ADF UNIT REMOVAL

G025

Preparation: Remove the following parts. (See Operation Panel Removal and Upper Unit Removal.)

1) Upper paper tray
2) Upper cover
3) 2 flat cables
4) ADF right and left covers
5) Grounding wire
6) Document tray
7) Upper unit
8) 6 connectors and a grounding wire

A: ADF unit (4 hooks)

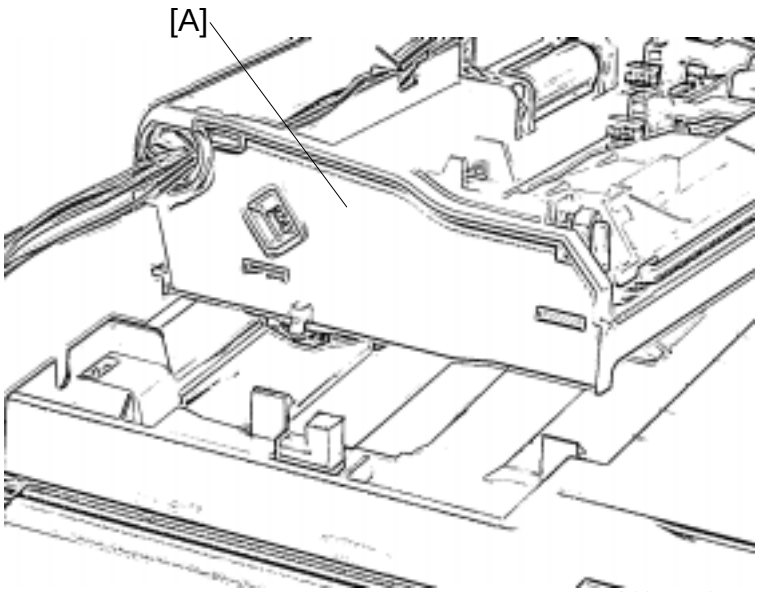


G027

Preparation: Remove the following parts. (See Upper Cover Removal.)

1) ADF upper cover
2) ADF right and left covers
3) ADF motor connector
4) Platen cover switch connector
5) 2 sensor connectors
6) Grounding wire

A: ADF unit (4 hooks)



G027R513.TIF

6.2.2 CCD UNIT REMOVAL

G025

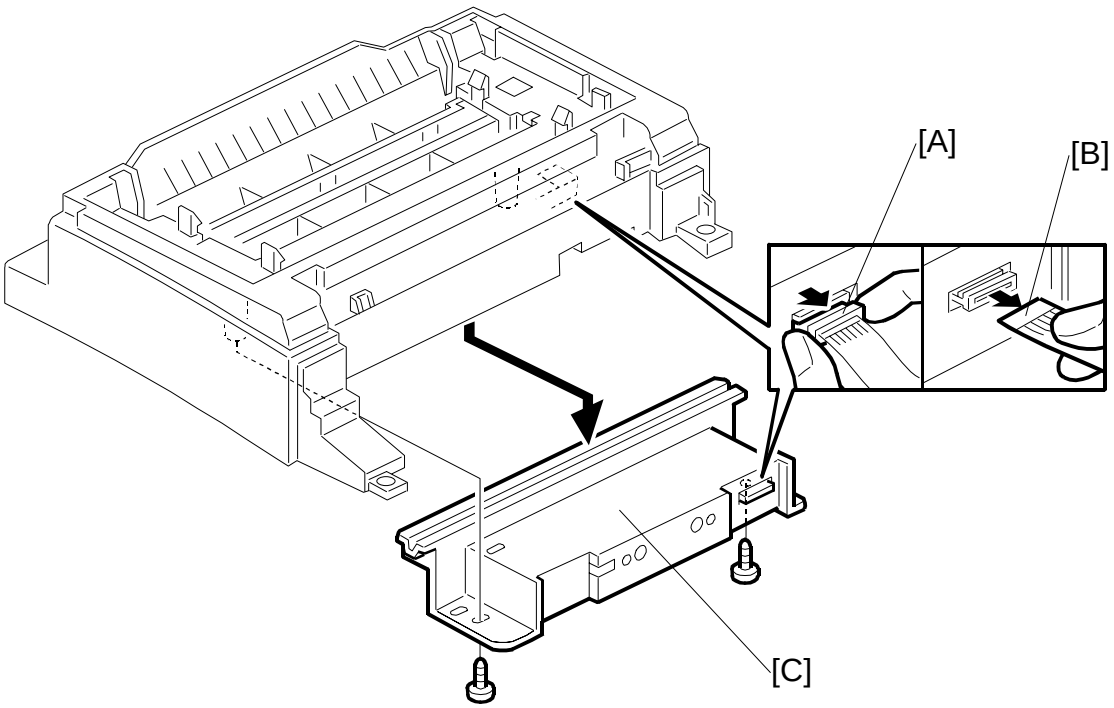
Preparation (See Upper Unit Removal)

1) Remove the upper unit.

A: Release (pull) the flat cable lock

B: Remove the flat cable

C: Remove the CCD unit (2 tapping screws)



G027R111.WMF

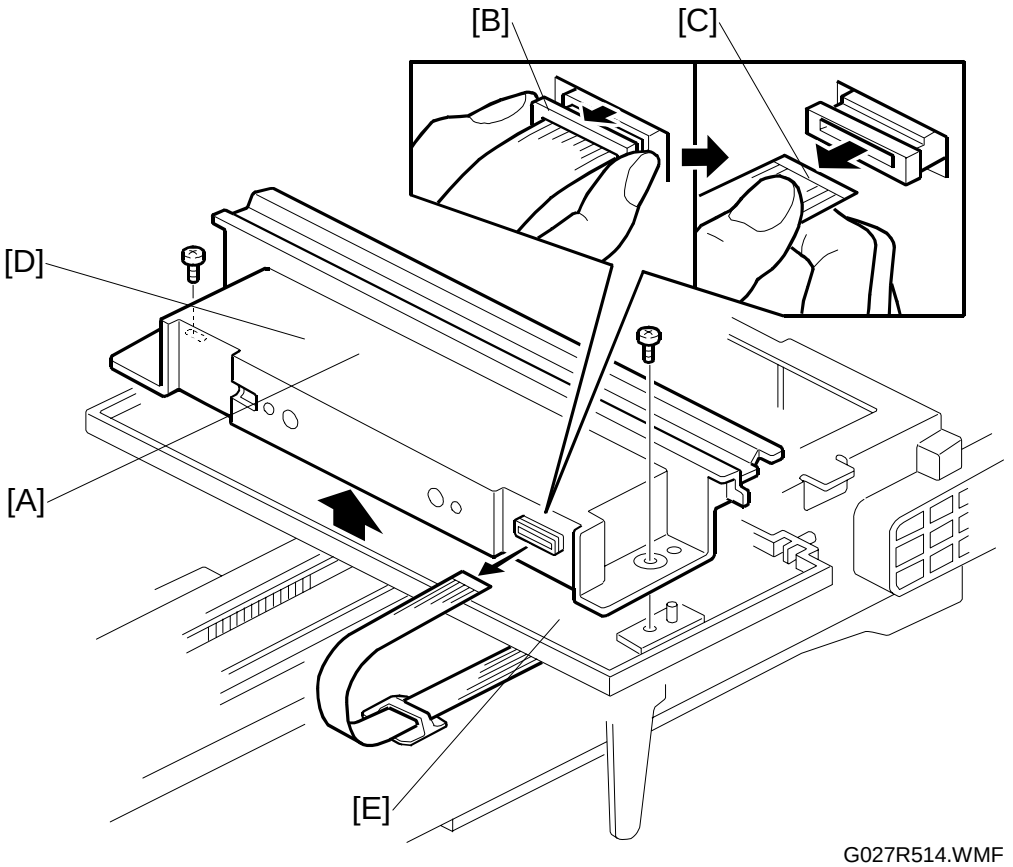
G027

Preparation

1) Remove the upper cover. (See Exterior Cover Removal.)

A: Slide the CCD unit away from the home position
B: Release (pull) the flat cable lock
C: Remove the flat cable
D: Remove the CCD unit (2 tapping screws)

While removing the tapping screws, hold down the CCD unit to prevent it from being twisted, which could cause the CCD base plate [E] to come off the rail.



Reinstallation

Do the ‘read start timing and CCD unit stop position’ adjustment.
Do the ‘read start point of horizontal scanning’ adjustment.

6.2.3 LASER UNIT REMOVAL

⚠WARNING FOR THE LASER UNIT

This machine contains a laser beam generator. Laser beams can cause permanent eye damage. Do not open the laser unit or look along the laser beam path while the main power is on.

G025

Preparation

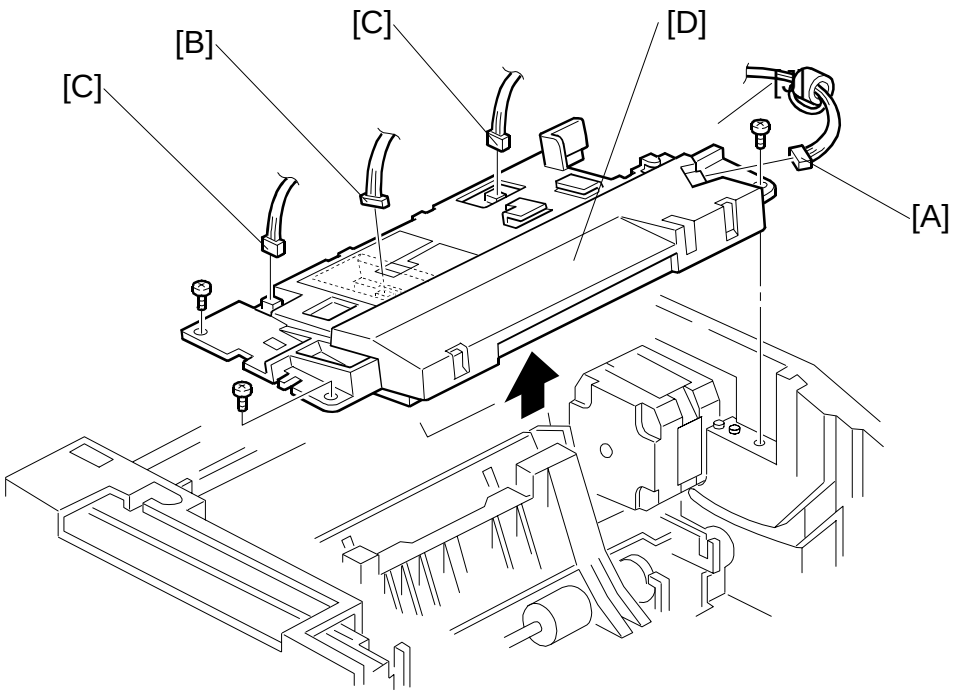
1) Remove the upper unit. (See Upper Unit Removal.)

A: Laser diode connector

B: Polygon mirror motor connector

C: 2 paper sensor connectors

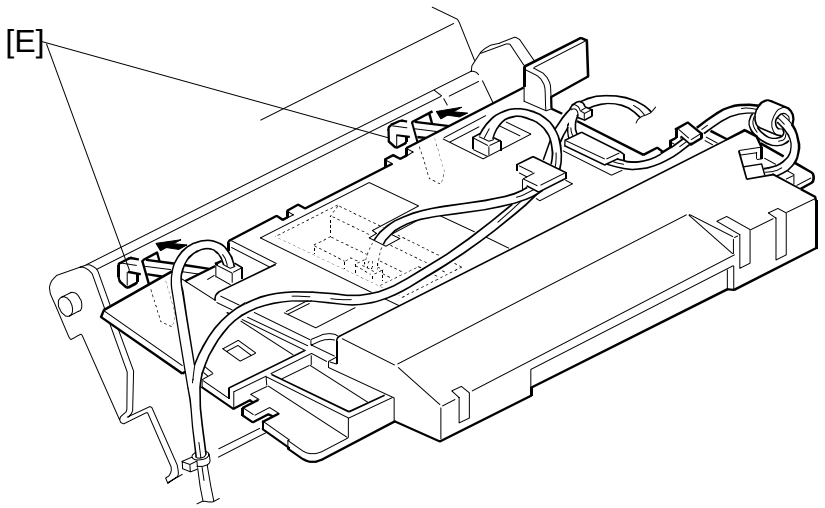
D: Laser unit (3 tapping screws: M3 x 10 mm)



G027R109.WMF

Reinstallation

Route the cable as shown.



G027R110.WMF

Do the registration adjustment.

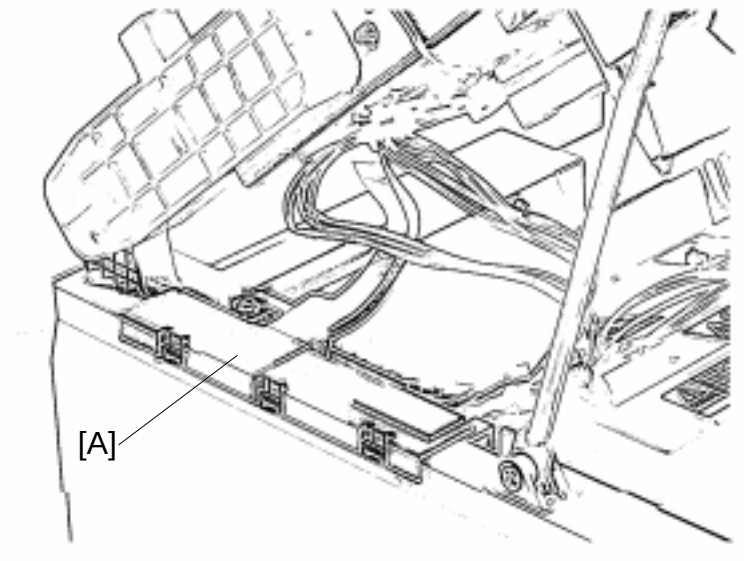
NOTE: 1) Make sure the two paper sensor actuators [E] are positioned in the slits of the upper tray bottom plate correctly.
2) Do not damage the mylar.

G027

Preparation

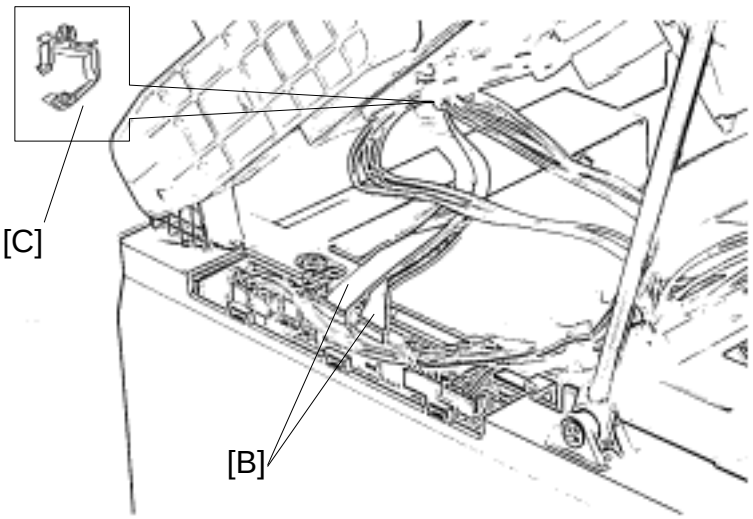
1) Remove the upper cover. (See Exterior Cover Removal.)
2) Open the upper unit.

Cable cover (3 hooks)



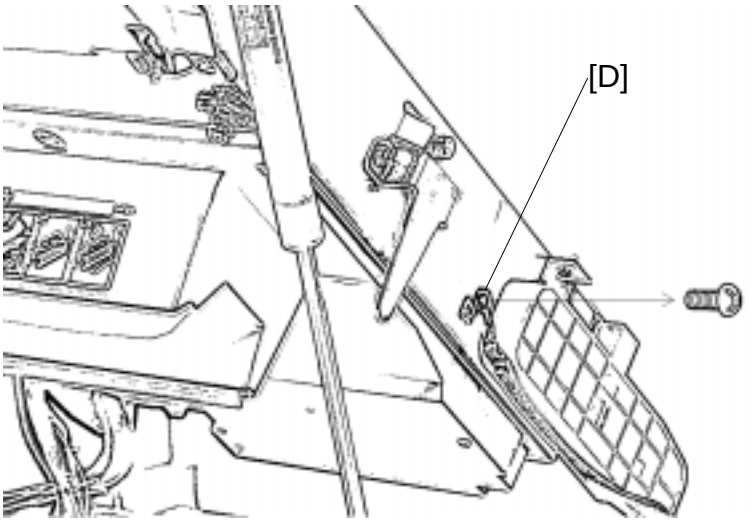
G027R515.TIF

A: 2 flat cables
C: Cable clamp



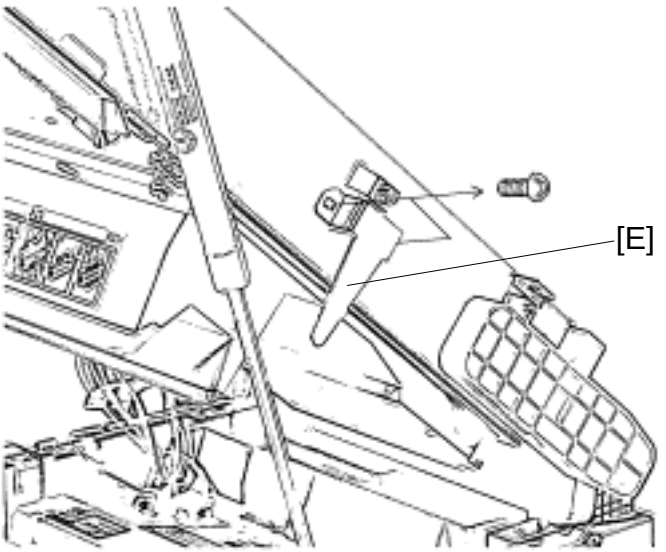
G027R516.TIF

D: Grounding wire (1 Philips screw)



G027R517.TIF

Interlock switch actuator (2 Philips screws)

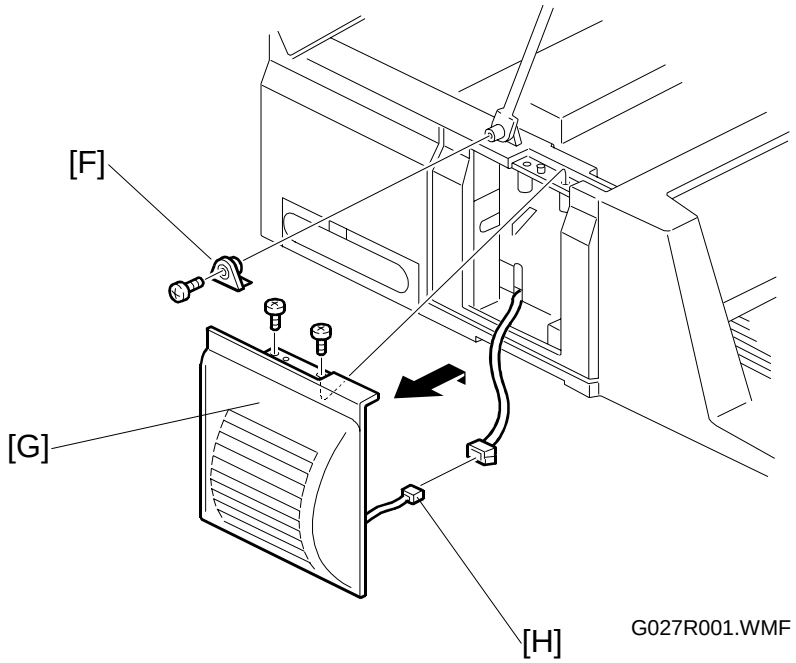


G027R518.TIF

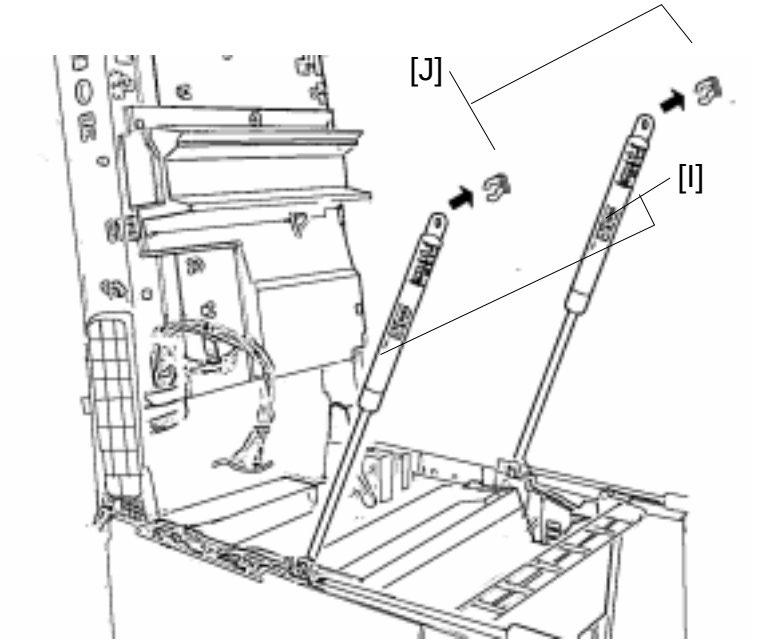
F: Gas spring cover (1 tapping screw)

G: Fan motor and fan motor cover (2 tapping screws)

H: Fan motor connector

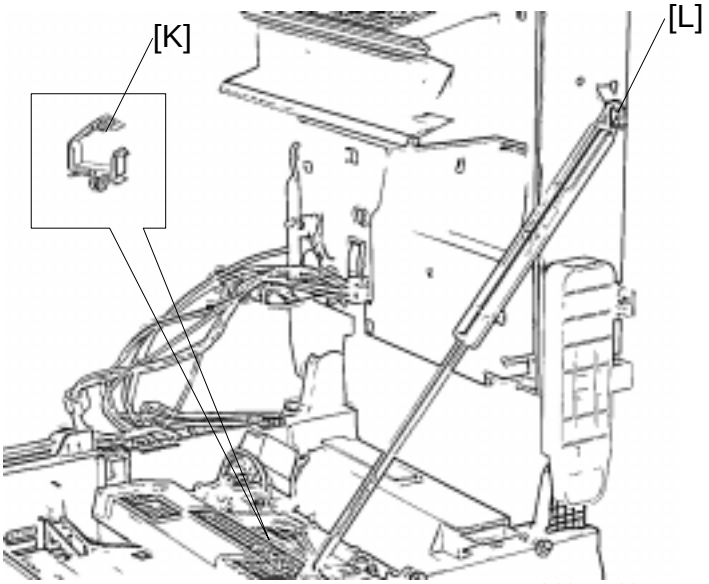


I: 2 gas springs
J: 2 snap rings



G027R519.TIF

Open the upper unit to 90 degrees and attach the gas spring to the maintenance pin.[K]
[L] Cable clamp



G027R520.TIF

⚠WARNING

1. Do not release the gas springs from their anchor posts while the upper unit is closed. Otherwise, they will expand suddenly and may cause injury.

2. When the gas springs are removed, hold the upper unit to prevent it from falling.

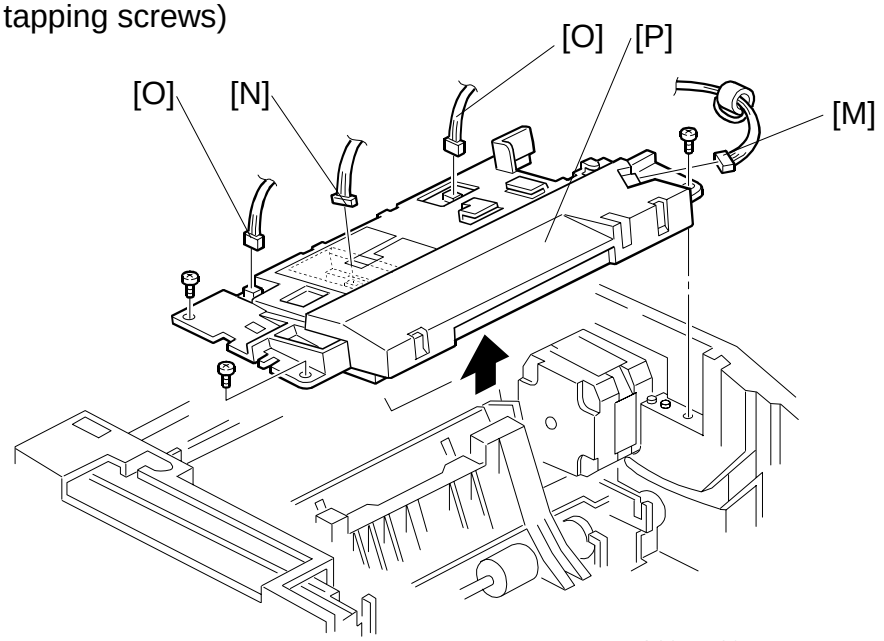
CAUTION: Do not leave the upper unit fully opened. Otherwise, the upper unit or the whole machine may be fall over and be damaged.

M: Laser diode connector

N: Polygon mirror motor connector

O: 2 paper sensor connectors

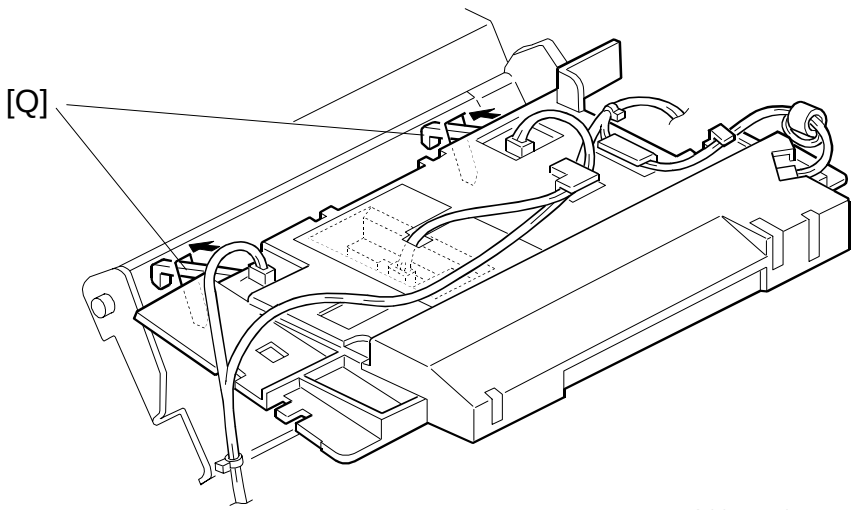
Laser unit (3 tapping screws)



G027R109.WMF

Reinstallation

Route the cable as shown.



G027R110.WMF

Do the registration adjustment.

NOTE: 1) Make sure the two paper sensor actuators [Q] are positioned in the slits in the upper tray bottom plate correctly.
2) Do not damage the mylar.

6.2.4 CCD DRIVE MOTOR REMOVAL (G027 ONLY)

Preparation

1) Remove the upper unit. (See Upper Unit Removal.)
2) Turn the upper unit upside down.

A: Scanner under cover (3 Philips screws)

B: Release the tension pulley (1 Philips screw).

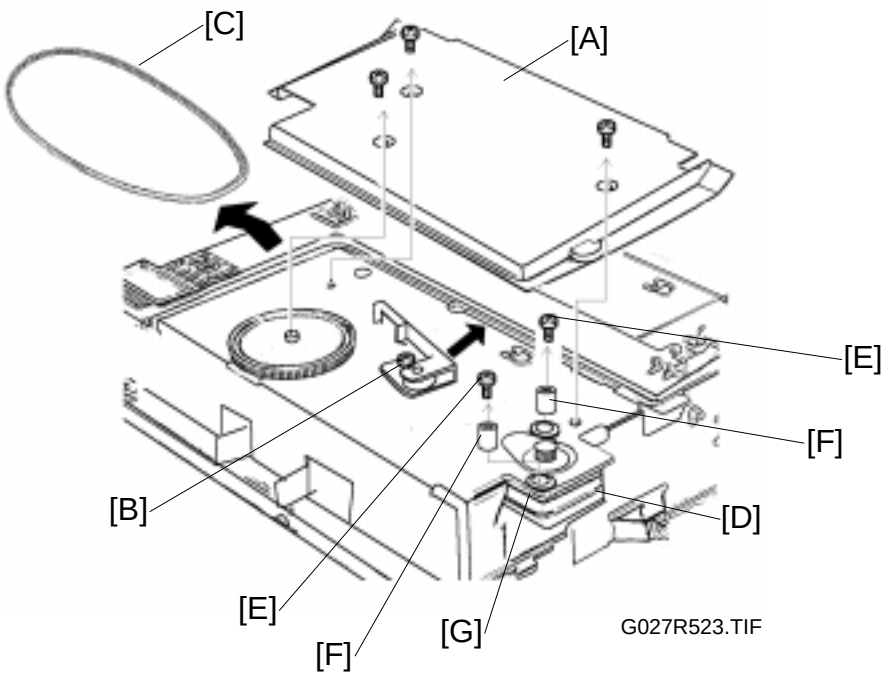
C: Timing belt

D: CCD drive motor

E: 2 Philips screws

F: 2 collars

G: Base bushing



6.3 PAPER FEED

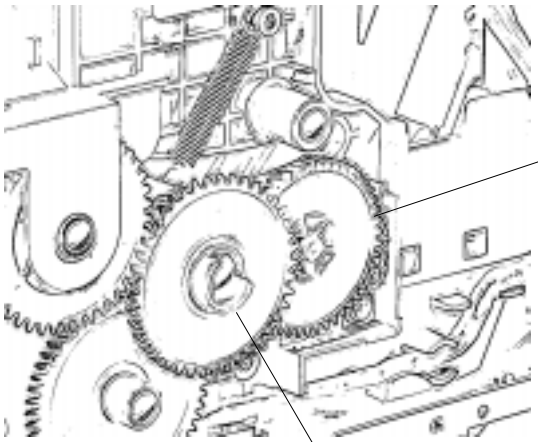
6.3.1 PAPER FEED ROLLER REMOVAL

Preparation

1) Remove the toner cassette.
2) Remove the upper unit. (See Upper Unit Removal.)
3) Remove the Laser unit. (See Laser Unit Removal.)
4) Remove the main motor bracket. (See Main Motor Removal.)

A: Gear

B: Gear

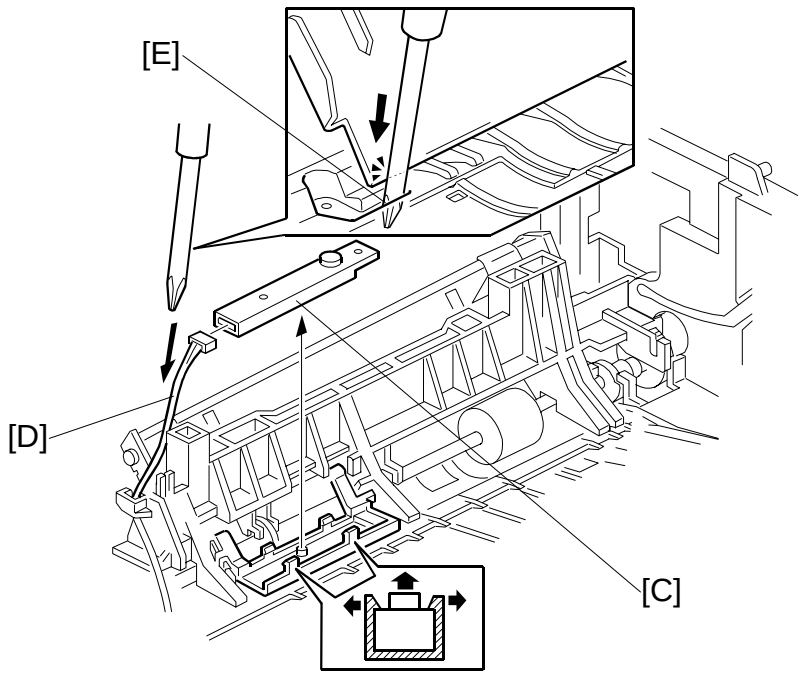


G027R524.TIF

C: Toner end sensor

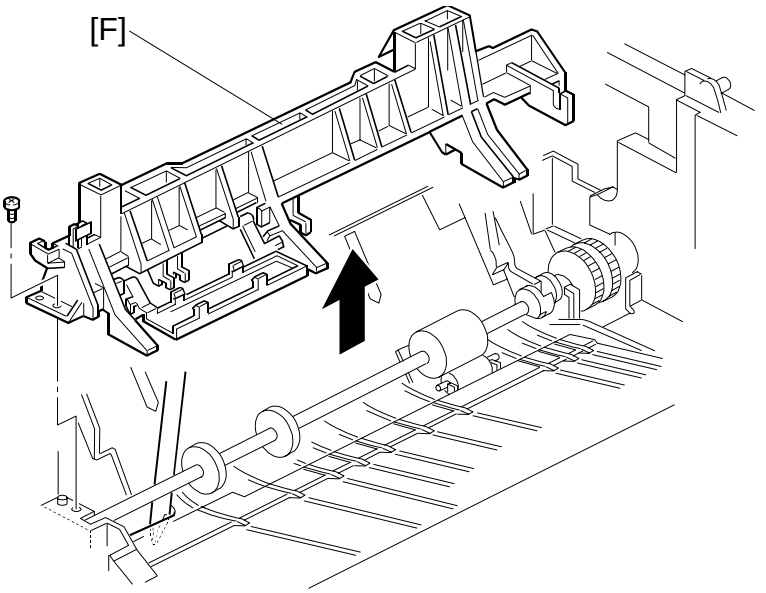
D: Connector and cable.

Insert a screwdriver in the hole in the left side [E] to hold the upper tray bottom plate apart from the paper feed roller.



G027R574.WMF

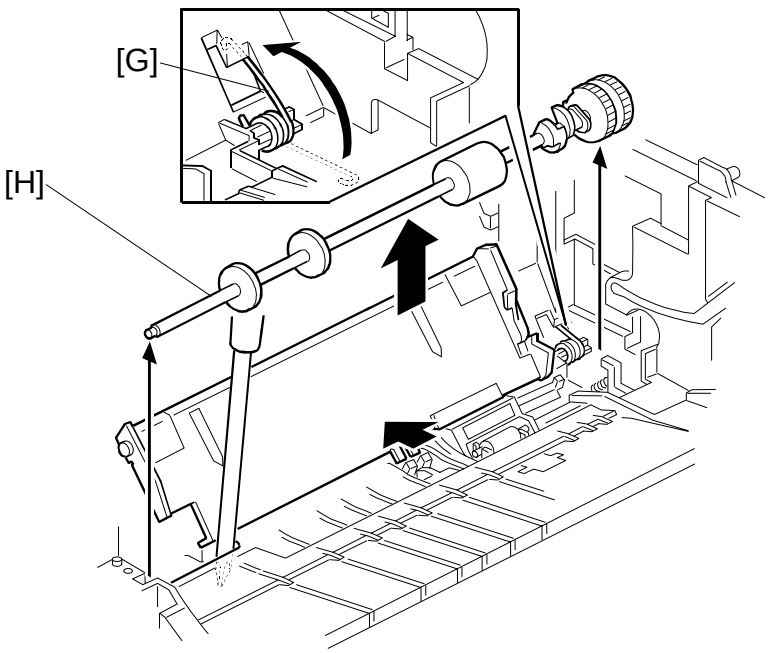
F: Paper feed roller guide (1 tapping screw)



G027R526.WMF

Hook the cam spring [G] in the cut out in the frame as shown below.

H: Paper feed roller

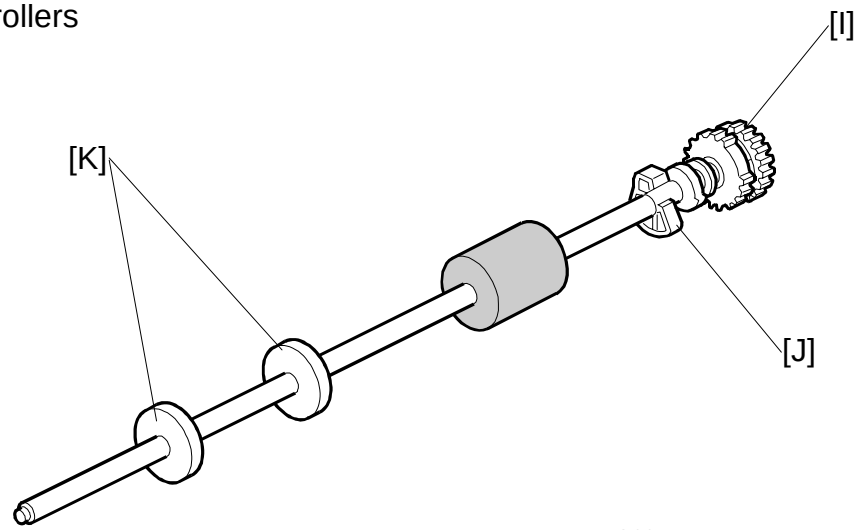


G027R527.WMF

I: Gear

J: Pick up cam

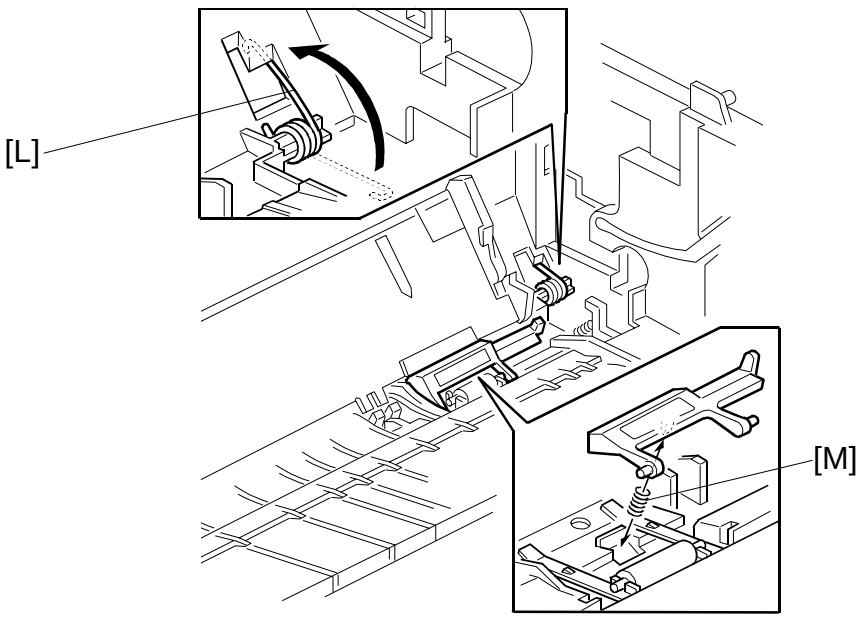
K: 2 Guide rollers



G027R117.WMF

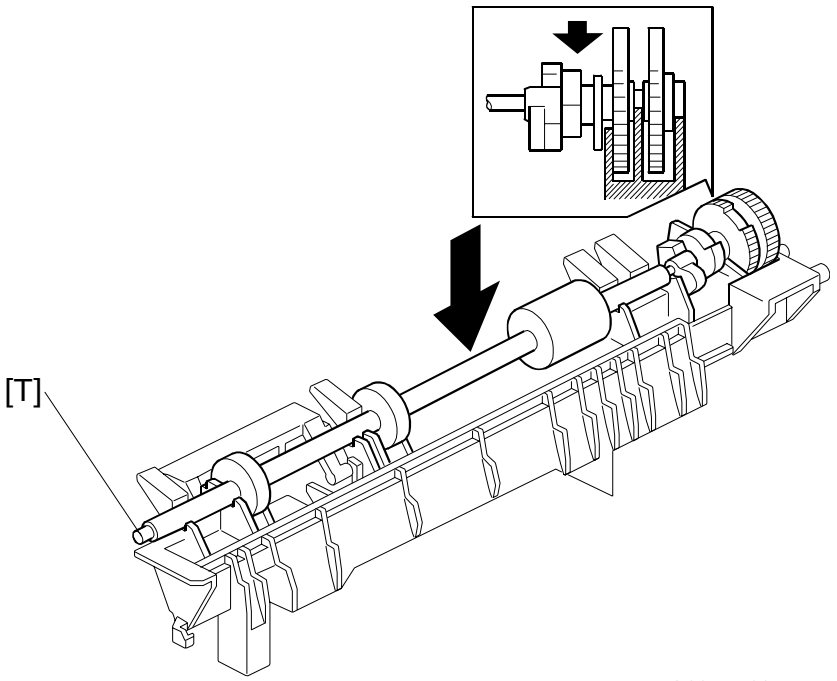
Reinstallation

1) Make sure that the end of the cam spring [L] is hooked in the cut out in the frame as shown below.
2) Make sure the friction pad spring [M] is set properly in the square notch as shown below.



G027R529.WMF

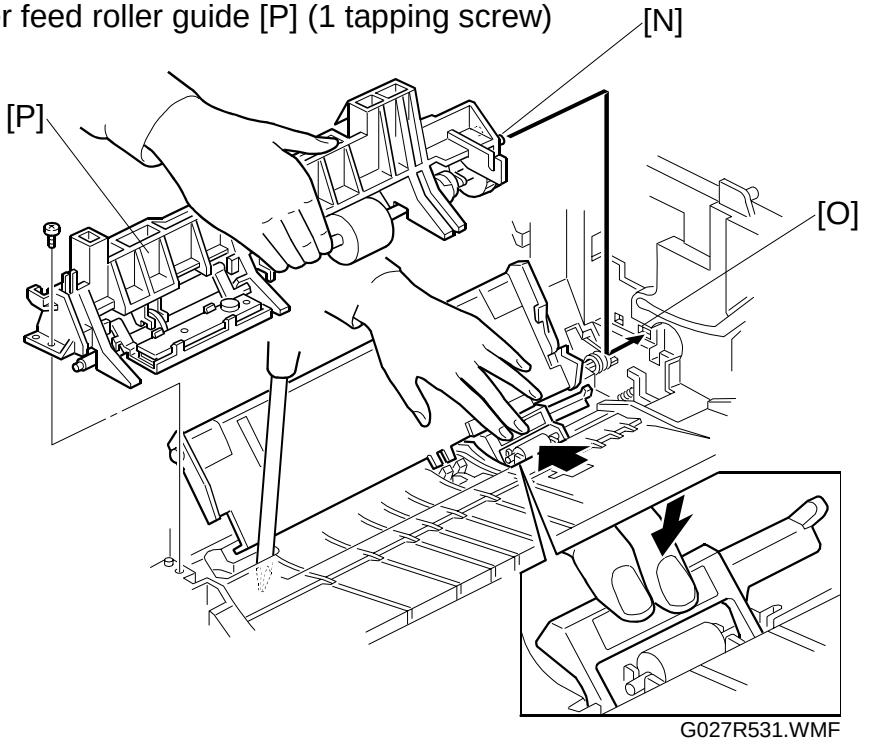
3) Make sure the guide rollers are positioned correctly as shown.



G027R530.WMF

NOTE: Apply grease (KS-660) to the guide roller shaft [T] to ensure ground contact.

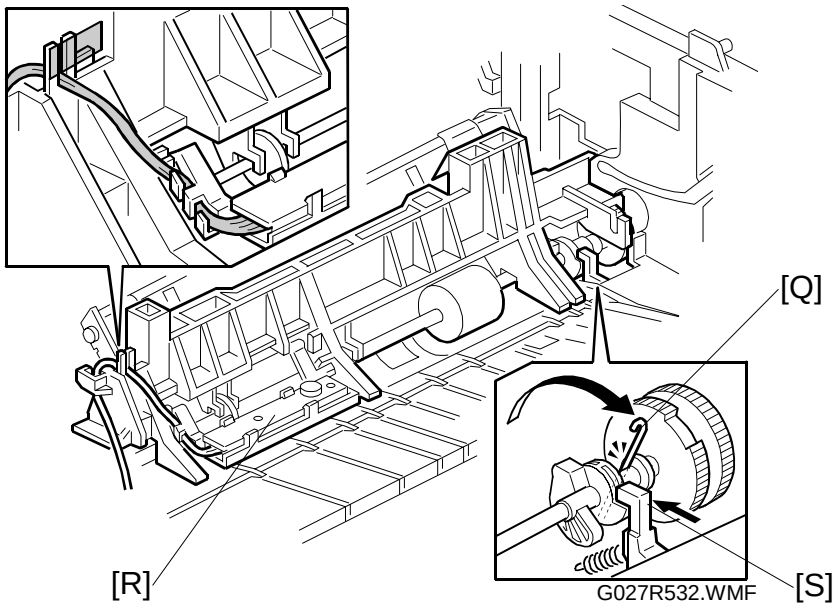
4) Install the paper feed roller assembly, so that the 2 pins [N] are set in the holes [O] in the frame, while pressing the friction pad.
5) Paper feed roller guide [P] (1 tapping screw)



G027R531.WMF

Make sure the paper feed roller assembly does not pinch the cable.

6) Unhook the end of the cam spring [Q] from the cutout in the frame and make sure it is located on the pick up cam as shown.
7) Install the toner end sensor [R] and the cable as shown.



8) Install the gears.

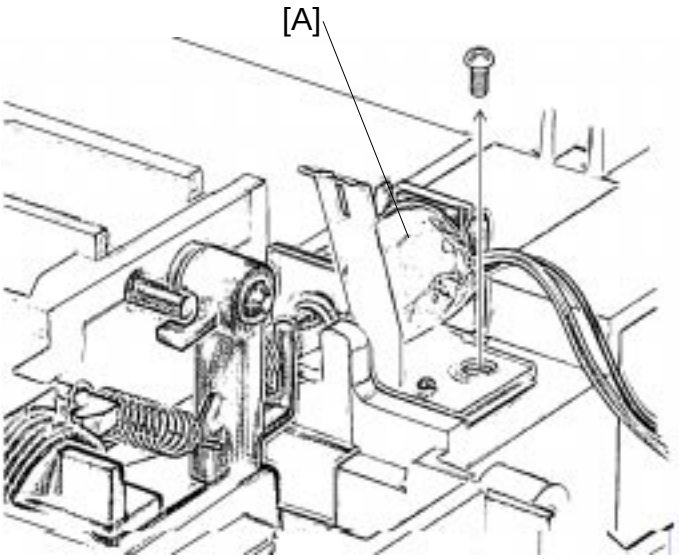
Make sure that the pick up cam stopper [S] is positioned correctly.

6.3.2 PAPER PICK-UP SOLENOID REMOVAL

Preparation

1) Remove the lower unit shell. (See Lower Unit Shell Removal)
2) Turn the lower unit shell upside down.

A: Paper pick-up solenoid (1 tapping screw)



G027R533.TIF

6.4 FUSING

6.4.1 FUSING UNIT REMOVAL

Preparation

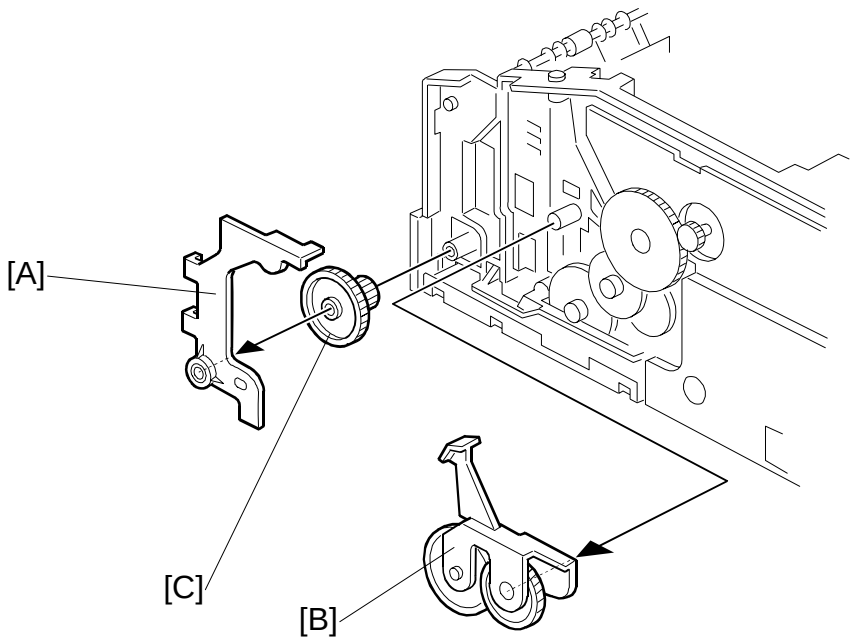
1) Remove the toner cassette.
2) Remove the upper unit.
3) Remove the right cover. (See Right Cover Removal)

A: Interlock switch actuator

B: Release lever and gears

C: Gear

NOTE: The following illustration is for the G025 model. G027 model illustrations are not included in this manual, because the procedures for the G027 model are the same as for the G025 model.



G027R113.WMF

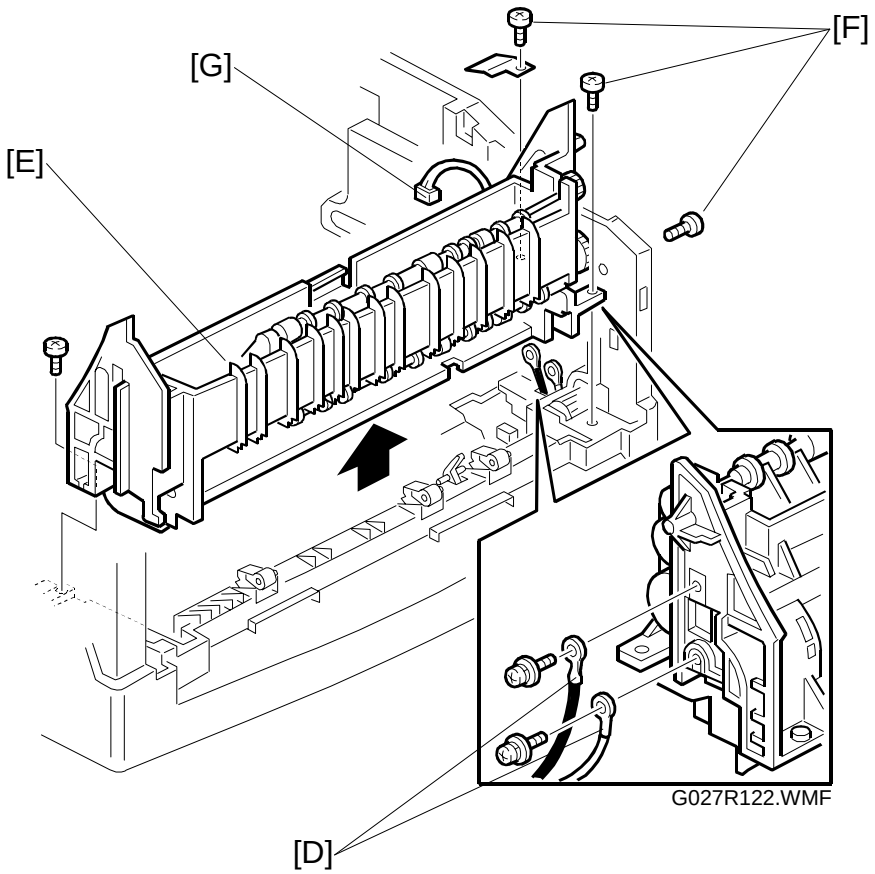
D: 2 fusing lead wires

E: Fusing unit

F: 4 tapping screws

G: Thermistor connector

NOTE: The following illustration is for the G025 model. G027 model illustrations are not included in this manual, because the procedures for the G027 model are the same as for the G025.



CAUTION: Do not remove the 2 white-painted screws that hold the upper and lower sections of the fusing unit together. Otherwise the fusing unit might be damaged.

Reinstallation

Make sure the black wire is connected to the upper terminal and the white wire is connected to the lower terminal as shown in the diagram.

CAUTION: Do not confuse the black wire and the white wire.

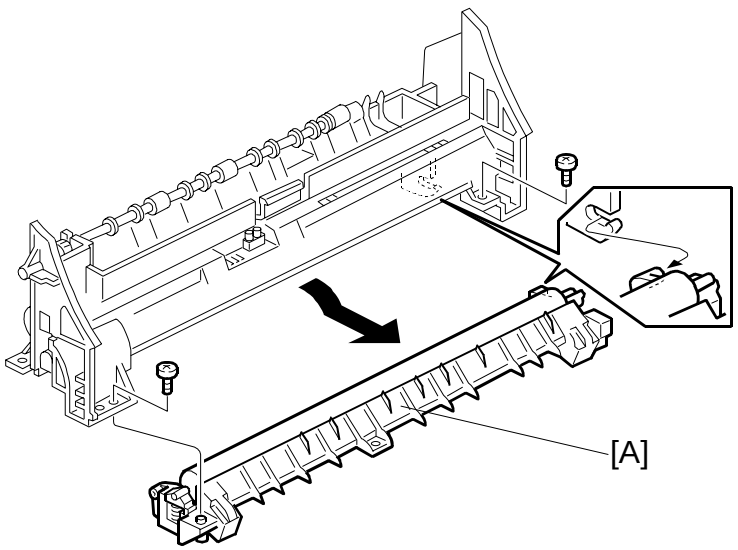
6.4.2 PRESSURE ROLLER REMOVAL

Preparation

1) Remove the fusing unit. (See Fusing Unit Removal.)

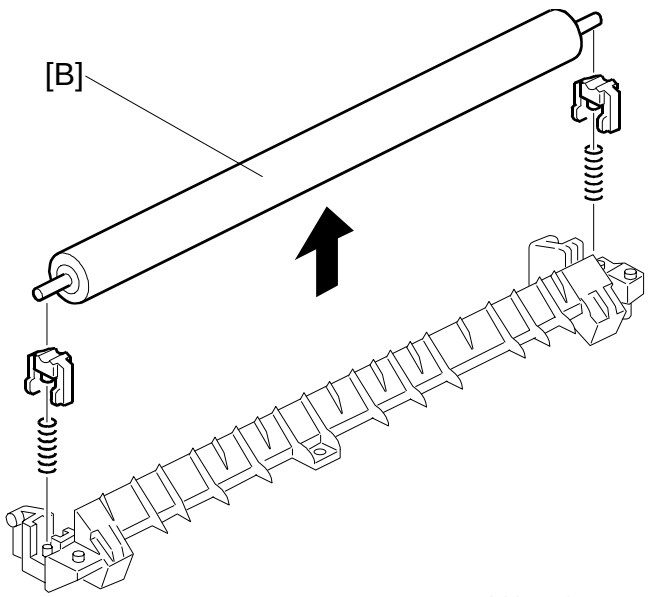
A: Fusing lower unit (2 white-painted tapping screws)

CAUTION: Hold the fusing unit's upper and lower sections securely together while removing the 2 screws. Otherwise the fusing unit might be damaged.



G027R123.WMF

B: Fusing pressure roller



G027R124.WMF

6.4.3 HOT ROLLER AND LAMP REMOVAL

Preparation

1) Remove the fusing unit. (See Fusing Unit Removal.)
2) Remove the fusing lower unit. (See Pressure Roller Removal.)

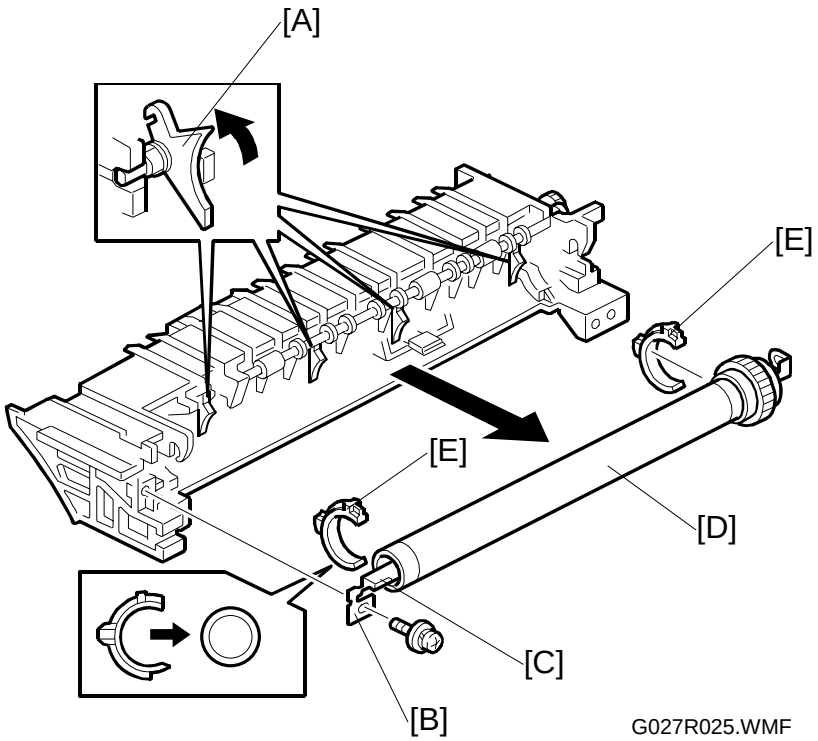
A: Rotate the stripper pawls away from the hot roller and secure them with tape.

B: Lamp terminal (1 Philips screw)

C: Fusing lamp

D: Hot roller

E: 2 bushings



Do not touch the surface of the hot roller or lamp with bare hands.

Reinstallation

NOTE: 1) Make sure that the bushings are oriented correctly as shown.
2) Do not damage the fusing thermistor.
3) Apply grease (KS-660) to the left bushing [E] to ensure ground contact.

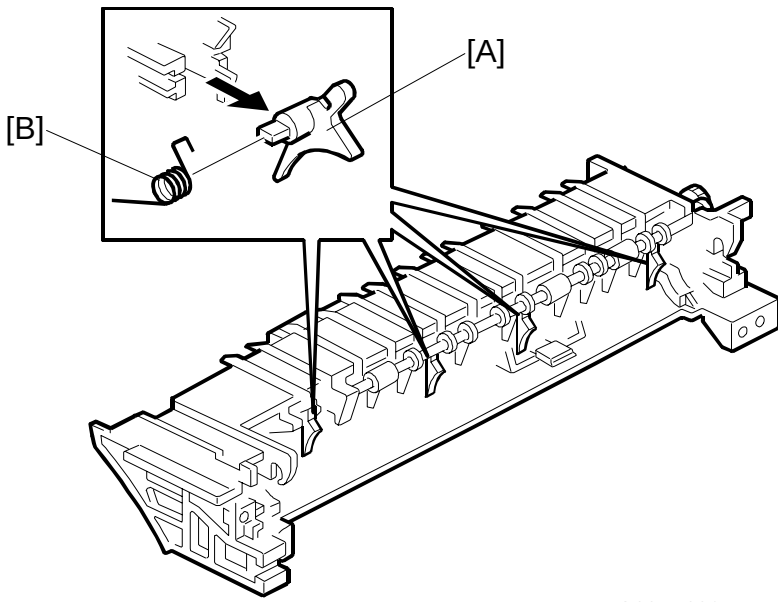
6.4.4 HOT ROLLER STRIPPER PAWL REMOVAL

Preparation

1) Remove the fusing unit. (See Fusing Unit Removal.)
2) Remove the hot roller. (See Hot Roller and Lamp Removal.)

A: 4 hot roller stripper pawls

B: 4 springs



G027R026.WMF

Reinstallation

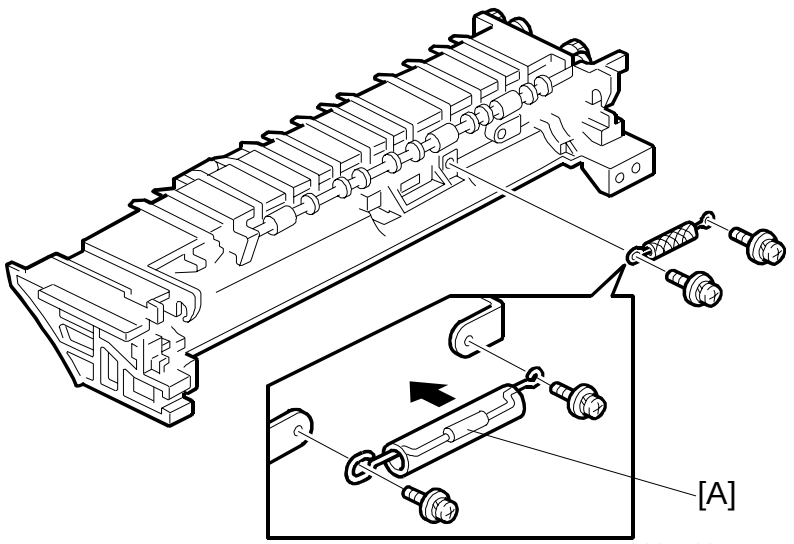
Do not deform the springs

6.4.5 FUSING THERMOFUSE REMOVAL

Preparation

1) Remove the fusing unit. (See Fusing Unit Removal.)
2) Remove the hot roller. (See Hot Roller and Lamp Removal.)

A: Fusing thermofuse (2 Philips screws)



G027R027.WMF

Reinstallation

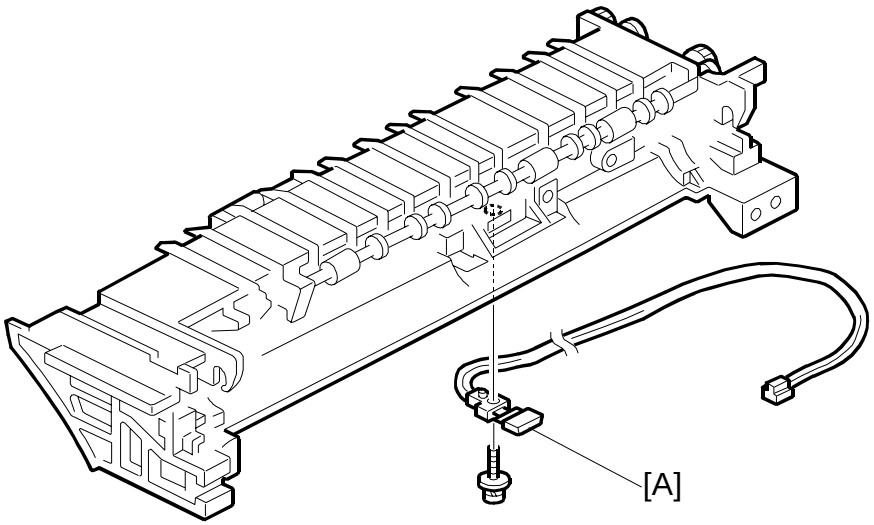
CAUTION: 1) Do not deform the thermofuse.
2) Do not install the thermofuse upside down.

6.4.6 FUSING THERMISTOR REMOVAL

Preparation

1) Remove the fusing unit.

A: Fusing thermistor (1 Philips screw)



G027R029.WMF

Reinstallation

CAUTION: Do not deform the thermistor.

6.5 OTHERS

6.5.1 MAIN MOTOR REMOVAL

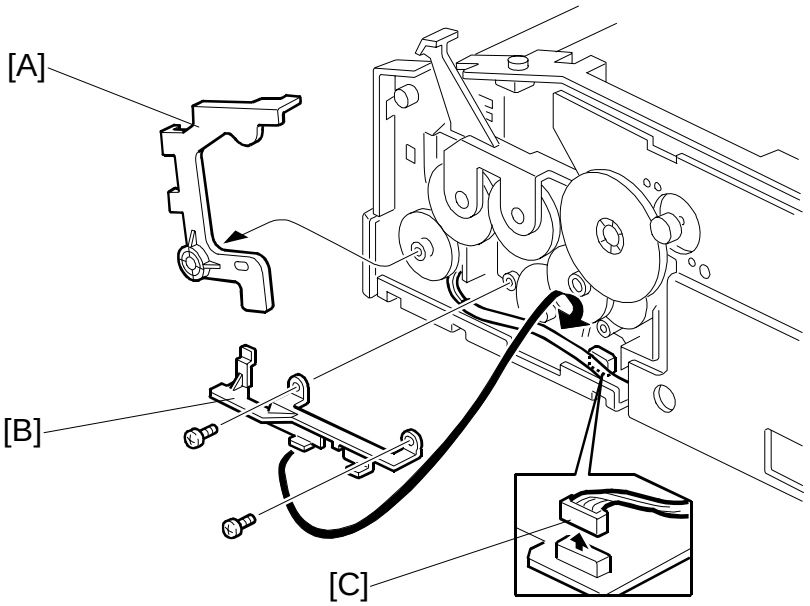
Preparation

1) Remove the upper unit. (See Upper Unit Removal.)
2) Remove the right cover. (See Right Cover Removal.)

A: Interlock switch actuator

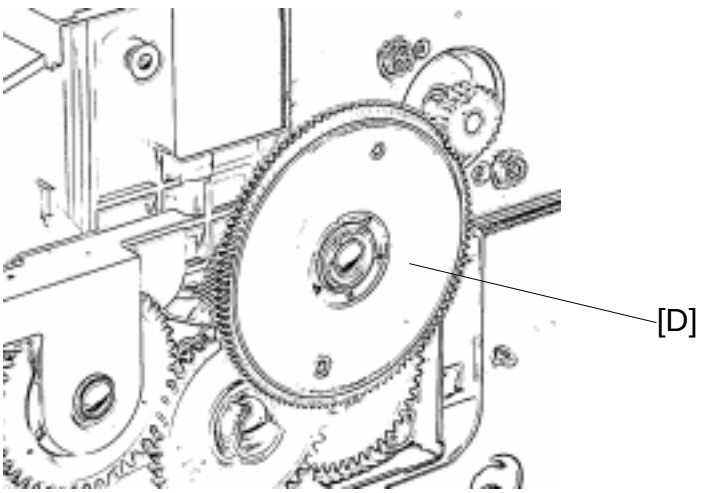
B: Cable guide (2 tapping screws)

C: Main motor connector



G027R541.TIF

D: Gear



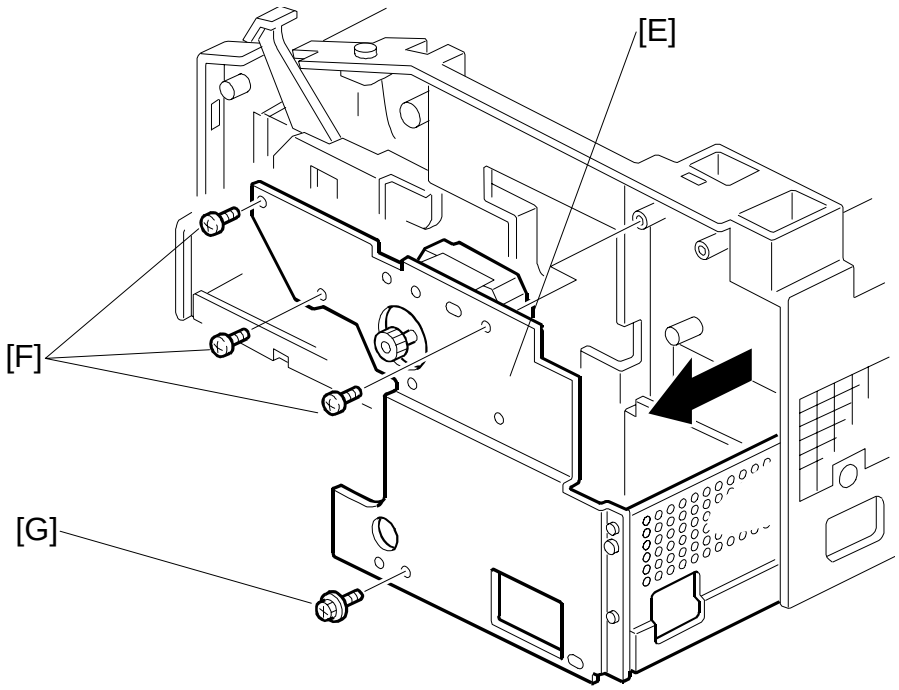
G027R551.TIF

E: Main motor bracket

F: 4 tapping screws

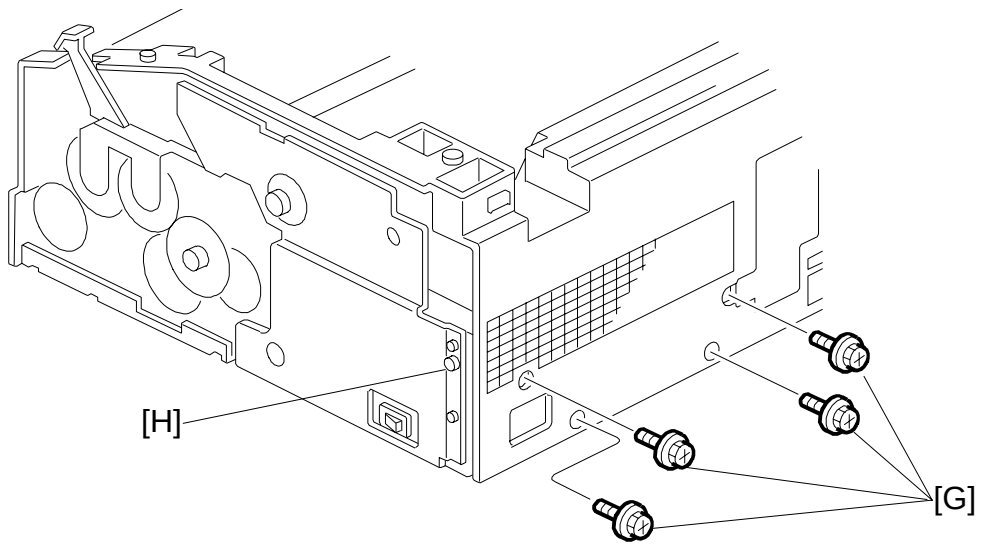
G: 5 Philips screws

NOTE: Remove 1 grounding wire (G027 only)



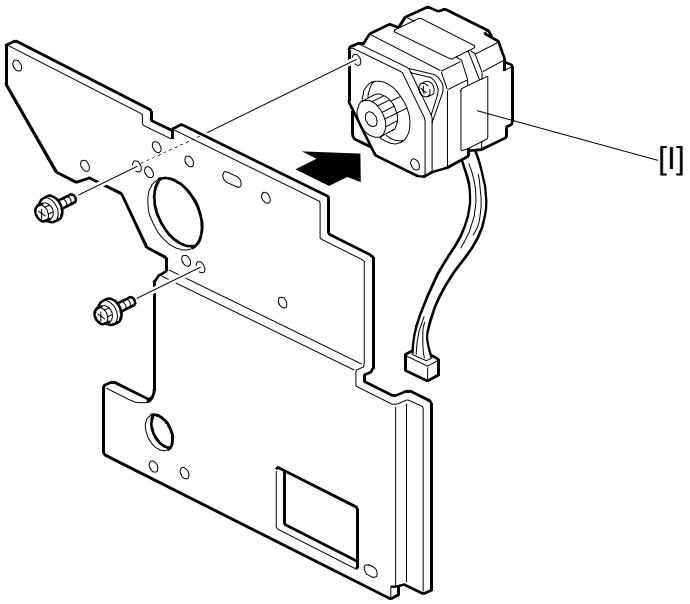
G027R131.WMF

Do not remove the bracket joining screw [H]



G027R132.WMF

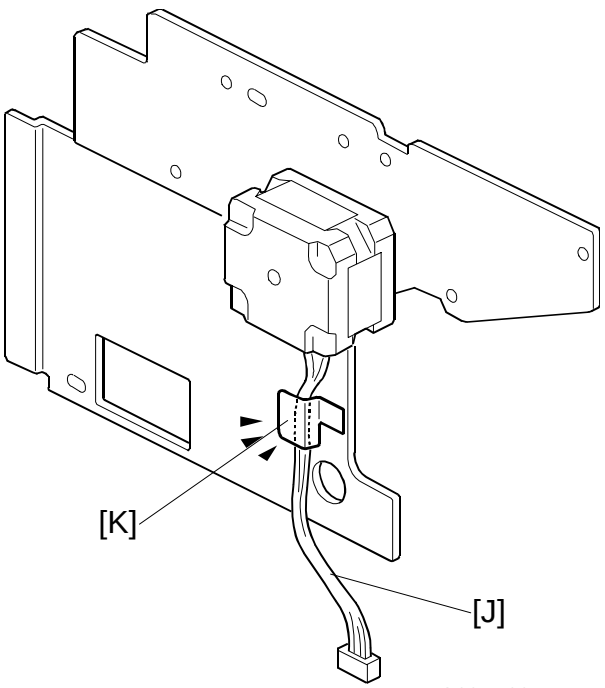
I: Main motor (2 Philips screws)



G027R033.WMF

Reinstallation

NOTE: 1) Install the main motor so that the cable [J] faces down as shown.
2) Make sure the main motor cable is secured under the cable cover [K].
3) Make sure no wires are pinched under the main motor bracket.



G027R034.WMF

6.5.2 TRANSFER ROLLER REMOVAL

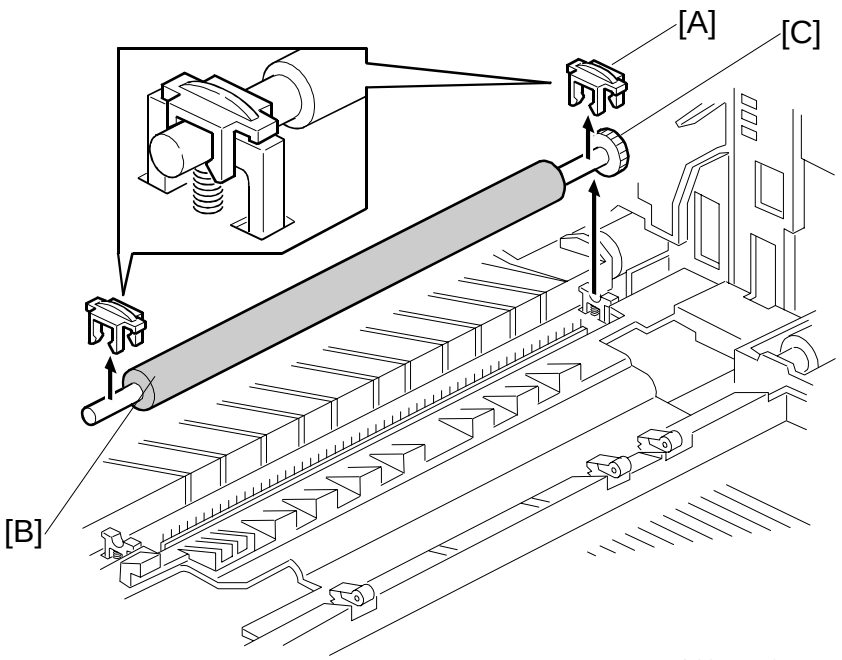
Preparation

1) Remove the toner cassette.

A: Transfer roller upper bushings.

B: Transfer roller

C: Gear



G027R556.WMF

Do not touch the transfer roller surface with bare hands.

Reinstallation

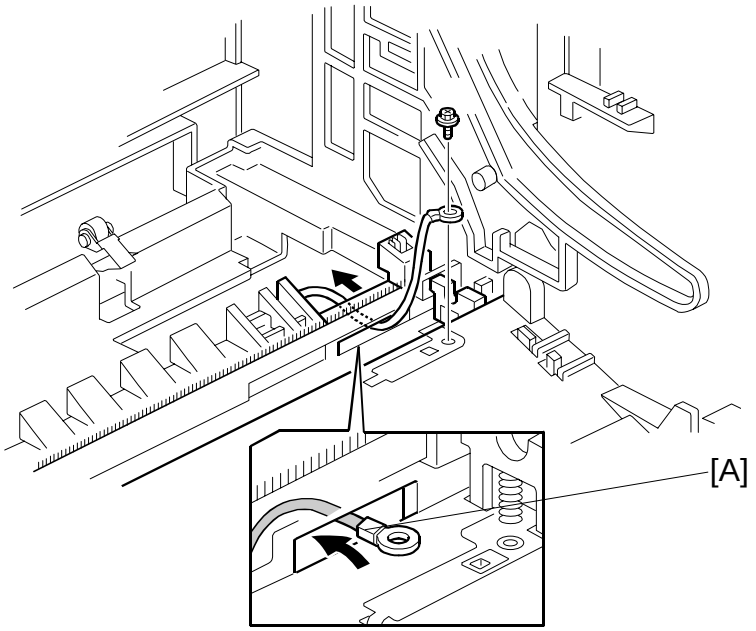
Make sure the upper bushings are set correctly as shown.

6.5.3 LOWER UNIT SHELL REMOVAL

Preparation

1) Remove the upper unit. (See Upper Unit Removal.)
2) Remove the Laser unit. (See Laser Unit Removal.)
3) Remove the fusing unit. (See Fusing Unit Removal.)
4) Remove the main motor. (See Main Motor Removal.)
5) Remove the transfer roller. (See Transfer Roller Removal.)
6) Remove the toner end sensor connector. (See Paper Feed Roller Removal.)

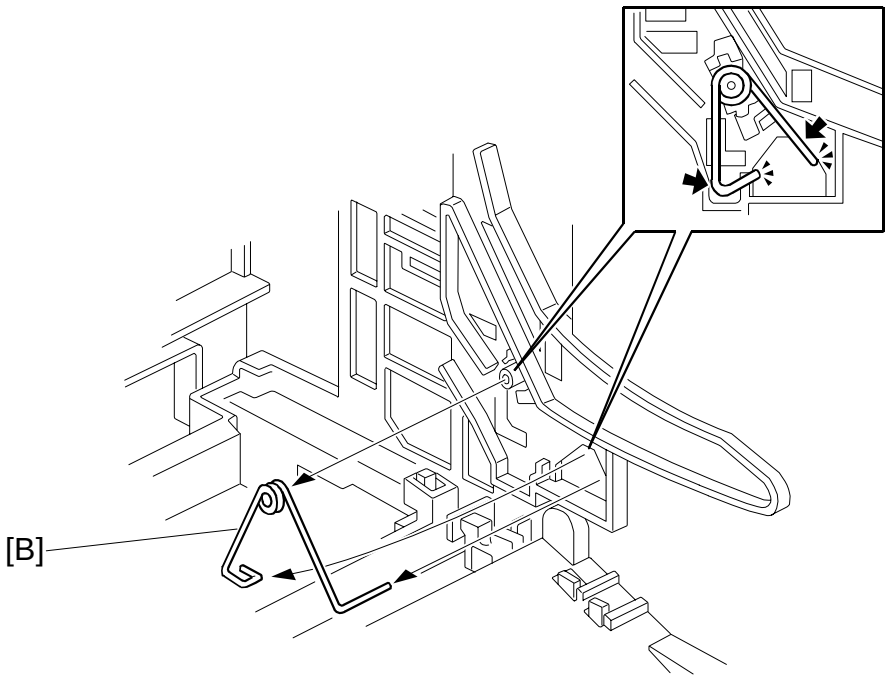
A: Transfer terminal (1 tapping screw)



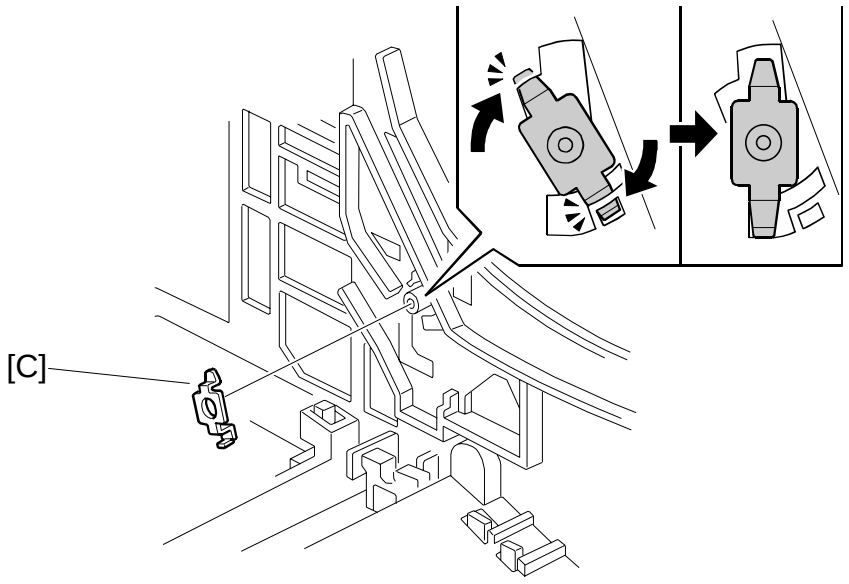
G027R557.WMF

B: Toner cassette stopper springs

C: Push the stopper holder and turn it clockwise to remove.



G027R570.WMF

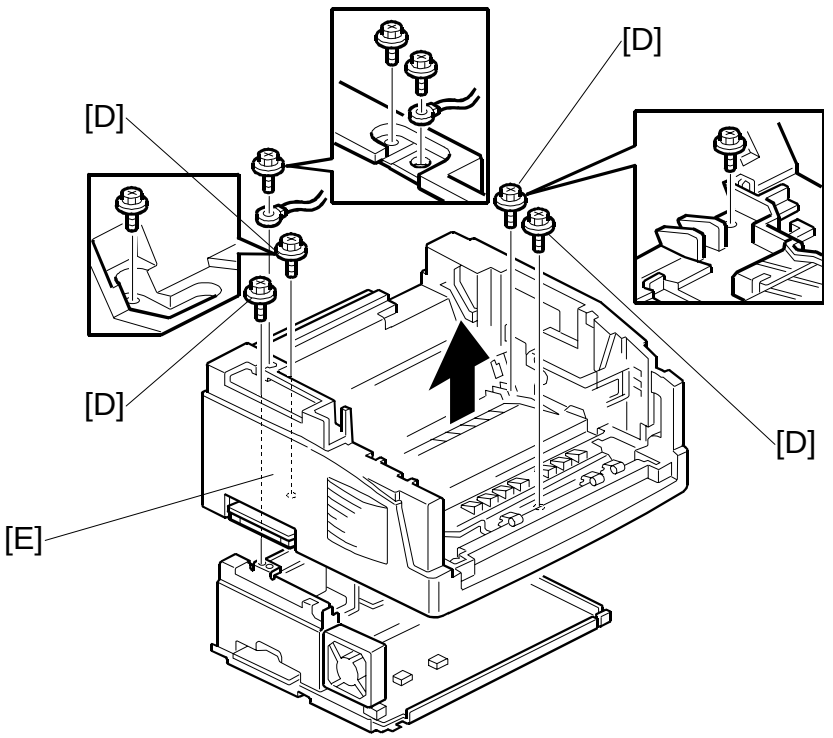


G027R558.WMF

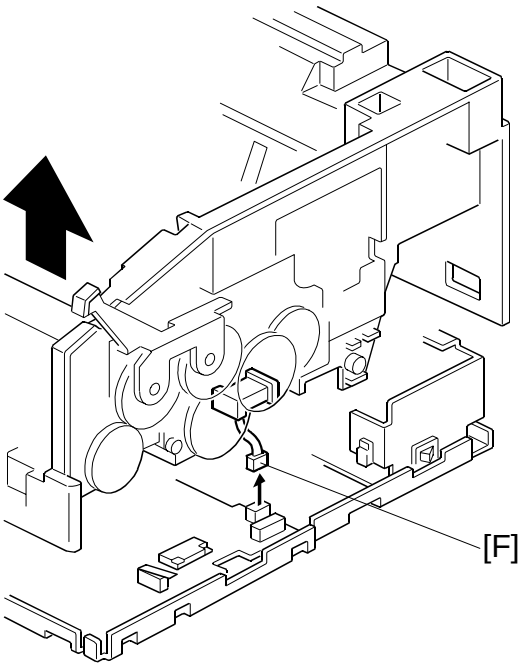
G025

D: 4 Philips screws

Lift the lower unit shell [E] slightly and remove the paper feed clutch solenoid connector [F].



G027R039.WMF

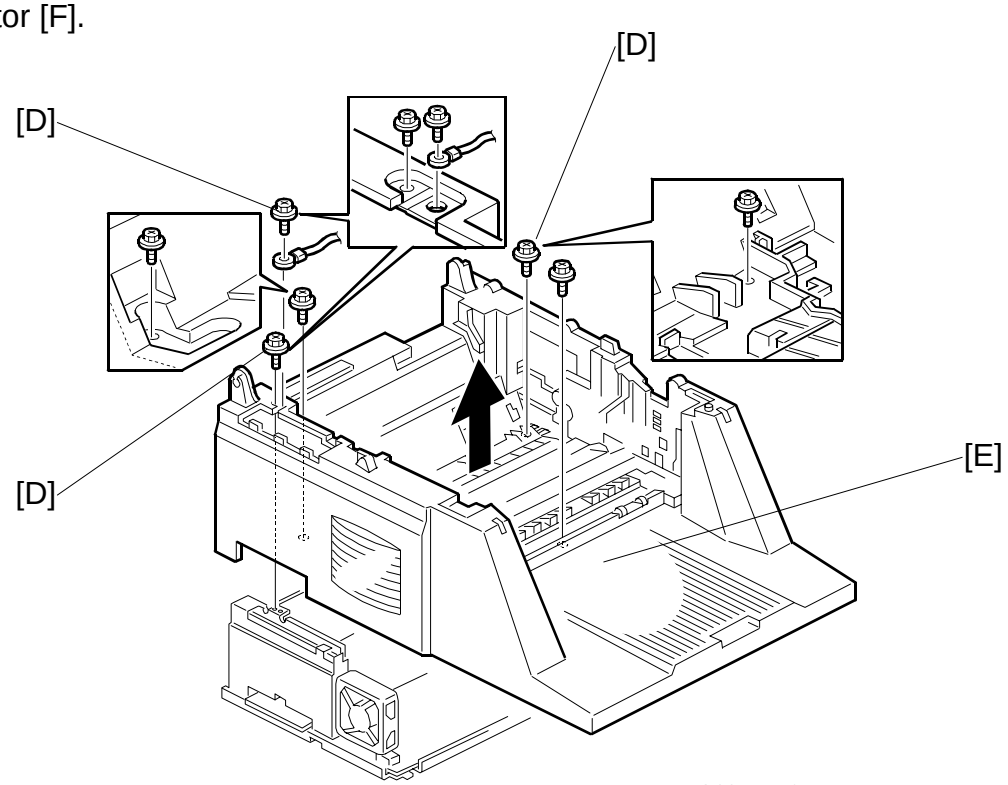


G027R040.WMF

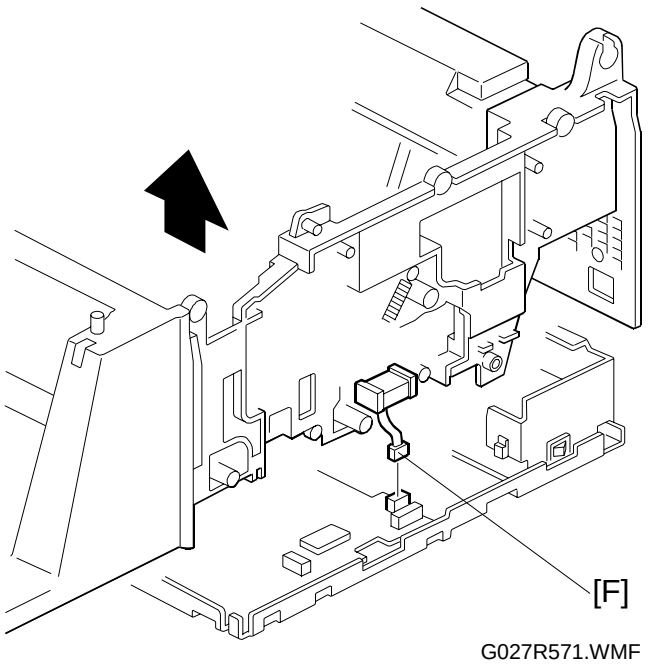
G027

D: 5 Philips screws

Lift the lower unit shell [E] slightly and remove the paper feed clutch solenoid connector [F].



G027R559.WMF



G027R571.WMF

G025/G027

Reinstallation

NOTE: 1) Make sure no wires are pinched under the frame unit.
2) Do not damage the terminal plates.

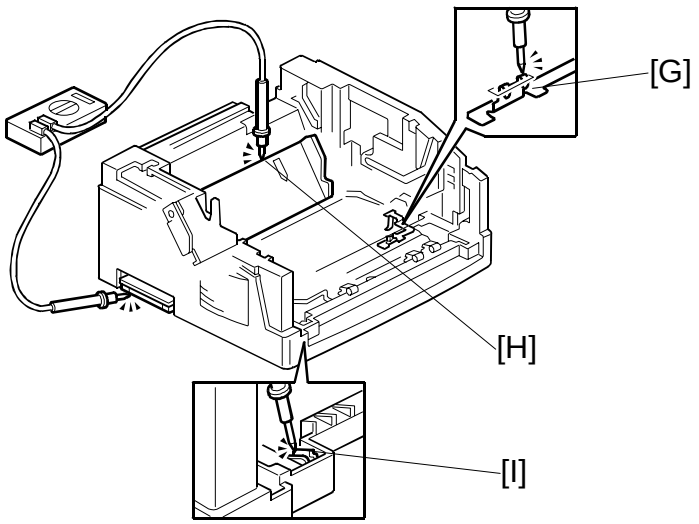
Confirm the following ground contacts:

G: Between paper pick-up solenoid and base frame.

H: Between the grounding terminal of the upper tray bottom plate and base frame.

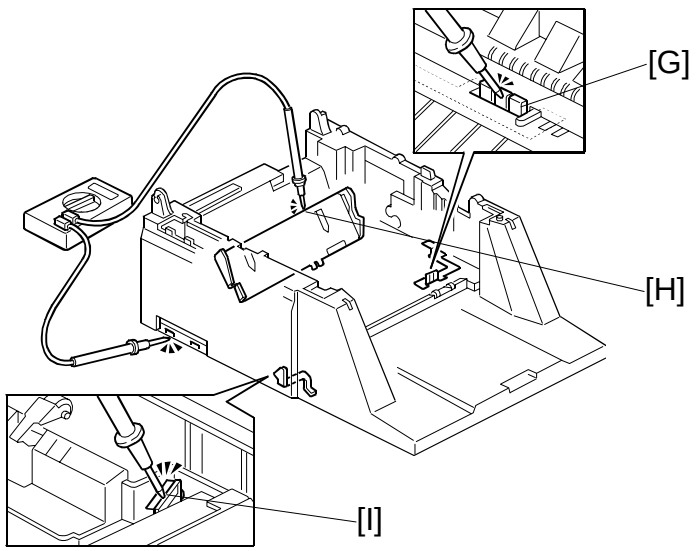
I: Between the grounding terminal of the fusing unit and base frame.

G025



G027R041.WMF

G027



G027R573.WMF

6.5.4 CONTROL BOARD AND SCANER CONTOROL BOARD REMOVAL

⚠CAUTION FOR LITHIUM BATTERY (MEMORY BACK-UP)
The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacture's instructions.

Preparation

1) Remove the lower unit shell.

A: Clamp

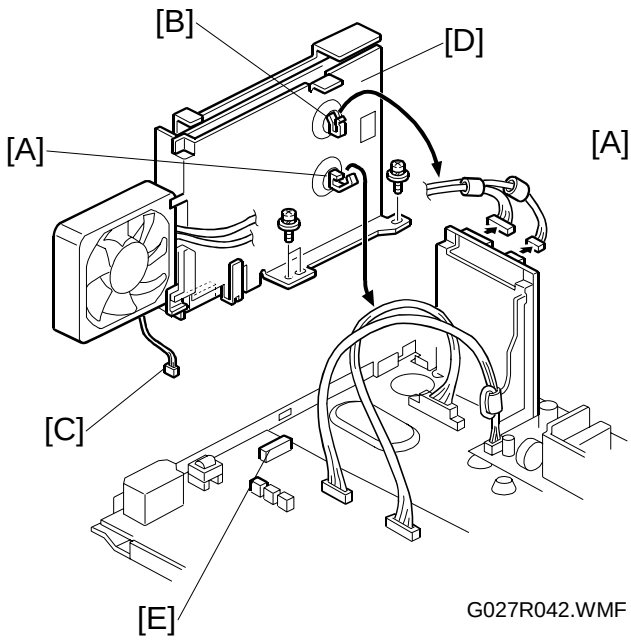
B: Clamp

C: Fan motor connector (G025 only)

D: Board assembly (2 Philips screws)

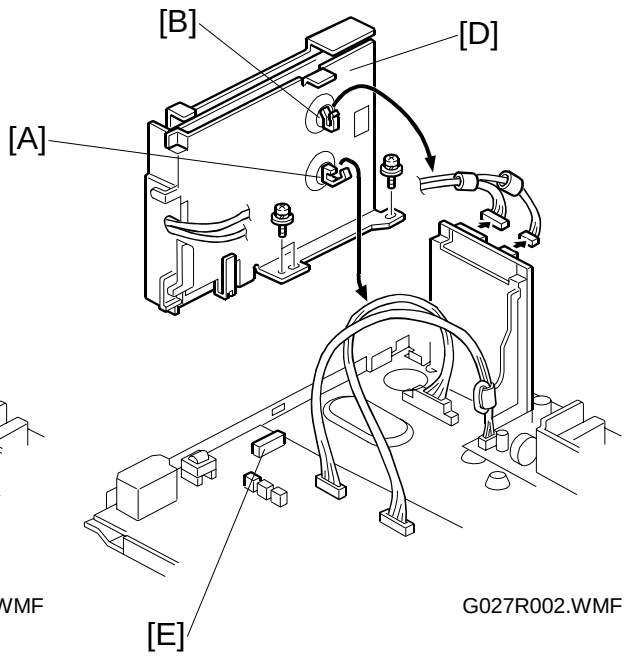
Disconnect the board assembly from the connector [E] on the mechanical control board.

G025



G027R042.WMF

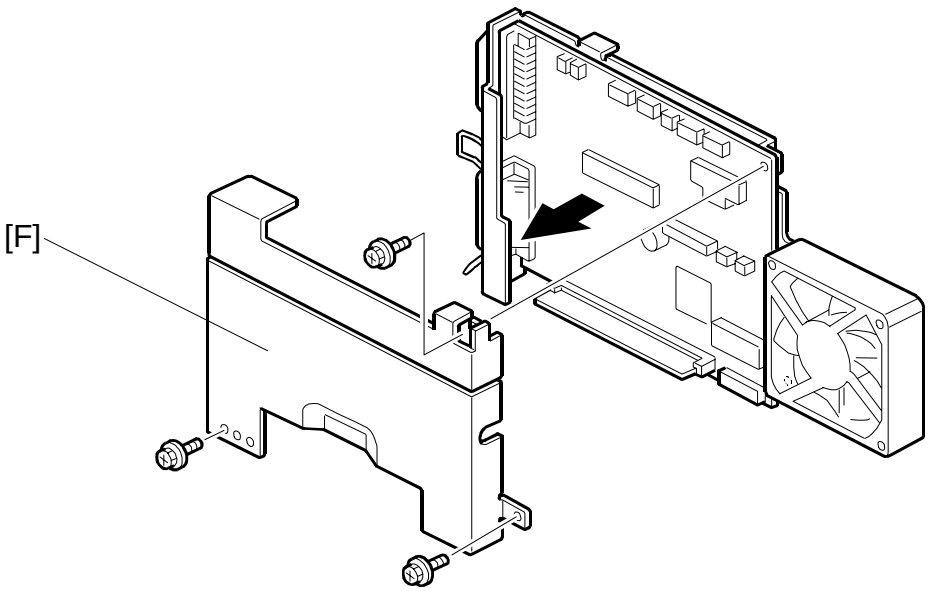
G027



G027R002.WMF

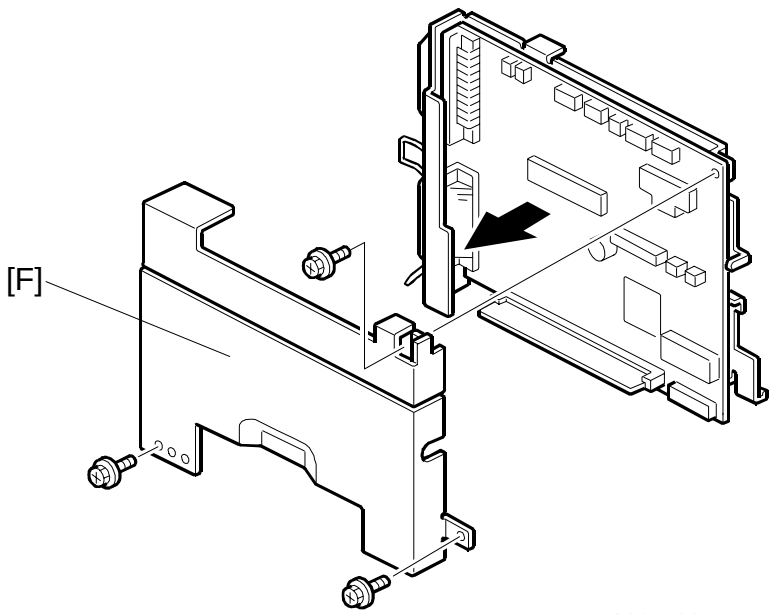
F: Shield cover (3 Philips screws)

G025



G027R043.WMF

G027

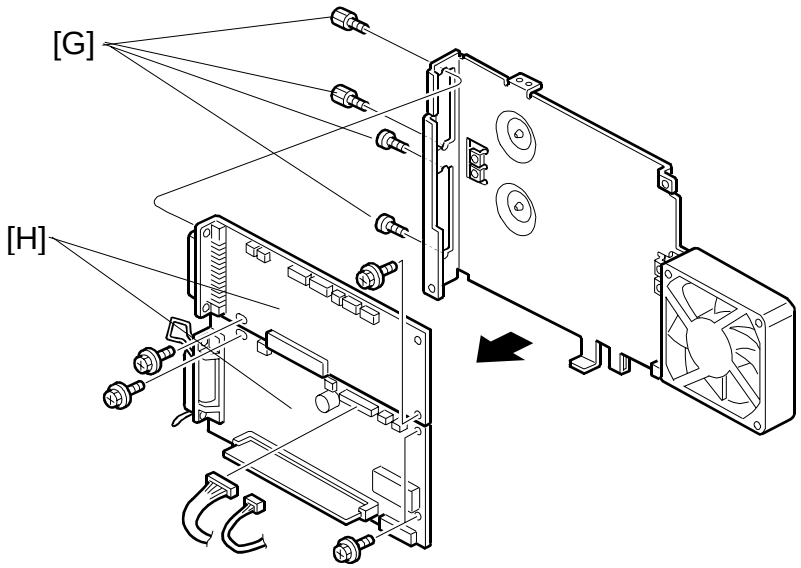


G027R004.WMF

G: Printer connector screws (2 Philips screws and 2 hexagon screws)

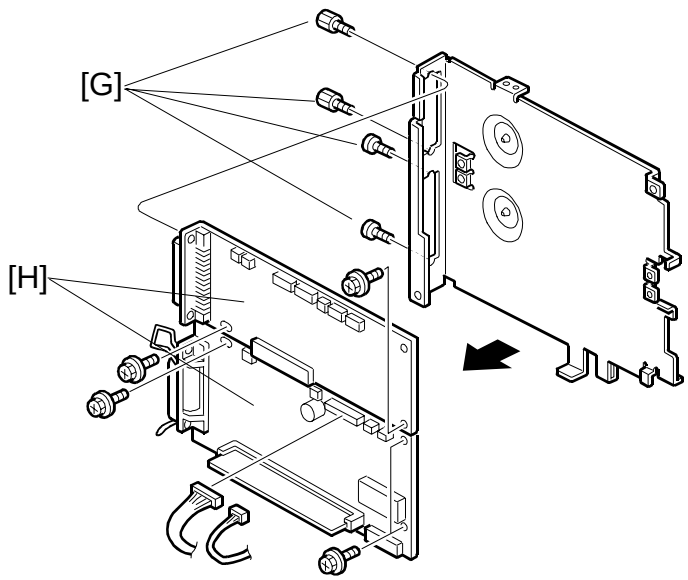
H: Control board and scanner control board (5 Philips screws)

G025



G027R044.WMF

G027



G027R003.WMF

Reinstallation

Execute RAM clear. (Refer to the section 4.)
Do the ‘registration’ adjustment.
Do the ‘read start timing and CCD unit stop position’ adjustment.
Do the ‘read start point of horizontal scanning’ adjustment.

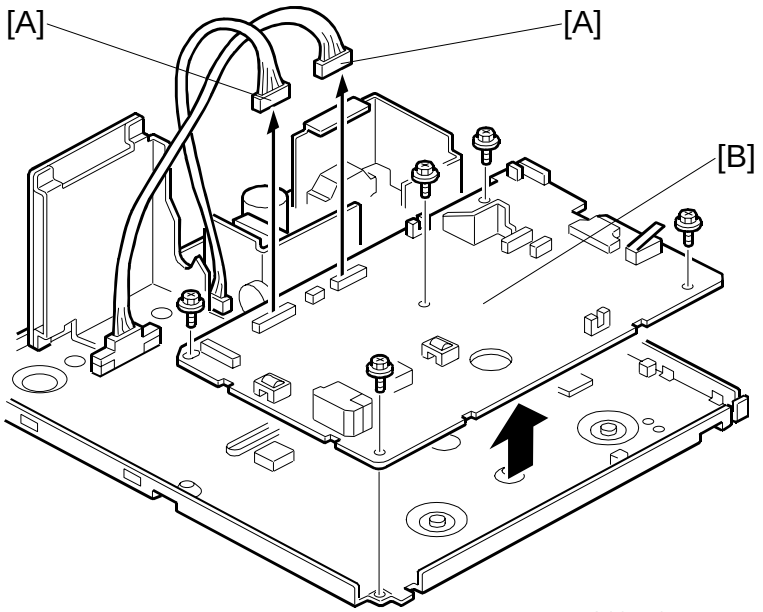
6.5.5 MECHANICAL CONTROL BOARD REMOVAL

Preparation

1) Remove the lower unit shell.
2) Remove the control board and scanner control board unit.

A: Connectors (CN8, CN12)

B: Mechanical control board (5 Philips screws)



G027R045.WMF

Reinstallation

Make sure that the insulation sheet is placed under the mechanical control board.

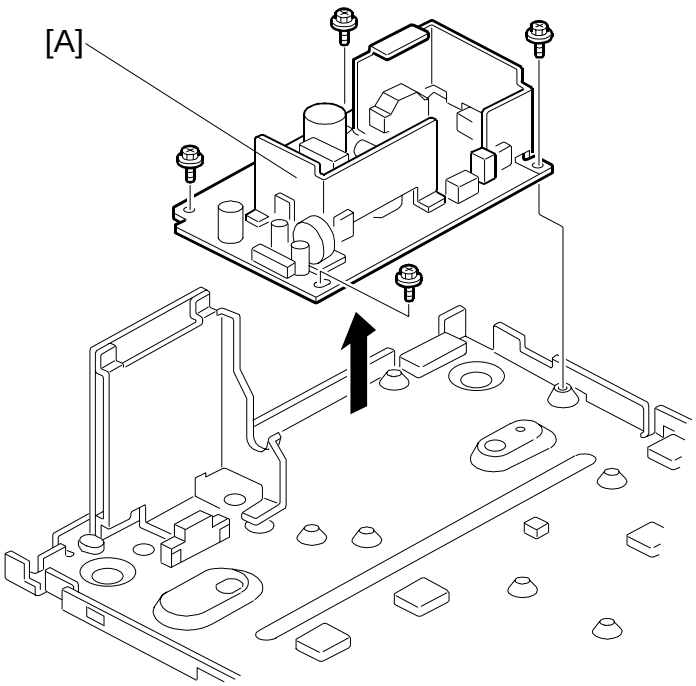
Do the registration adjustment.

6.5.6 POWER SUPPLY UNIT REMOVAL

Preparation

1) Remove the lower unit shell. (See Lower Unit Shell Removal.)

A: Power supply unit (4 Philips screws)



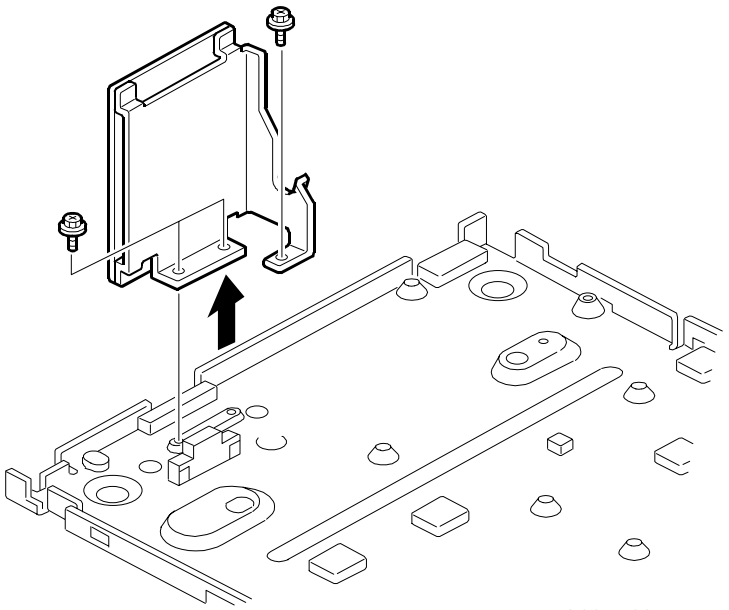
G027R046.WMF

6.5.7 NETWORK CONTROL BOARD REMOVAL

Preparation

1) Remove the lower unit shell.

A: Network control board (2 Philips screws)



G027R005.WMF

6.6 ADJUSTMENT

6.6.1 REGISTRATION ADJUSTMENT

Adjustment Standard:

5.1 ± 0.5 millimeters

Adjustment Tool:

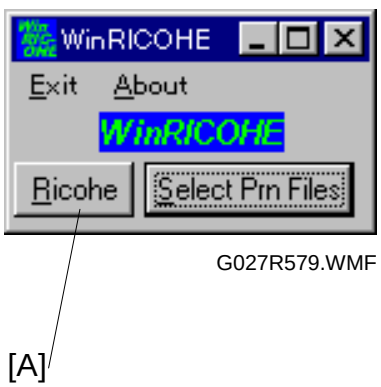
Service Switch 04: Start timing for data writing. (00 (H) to FF (H), 0.1 millimeter/unit)
The factory setting of Service Switch 04 is on the “System Parameter List”.

Personal computer (with Windows 95 or 98 installed.)
WinRICOHE (Test pattern 0210)

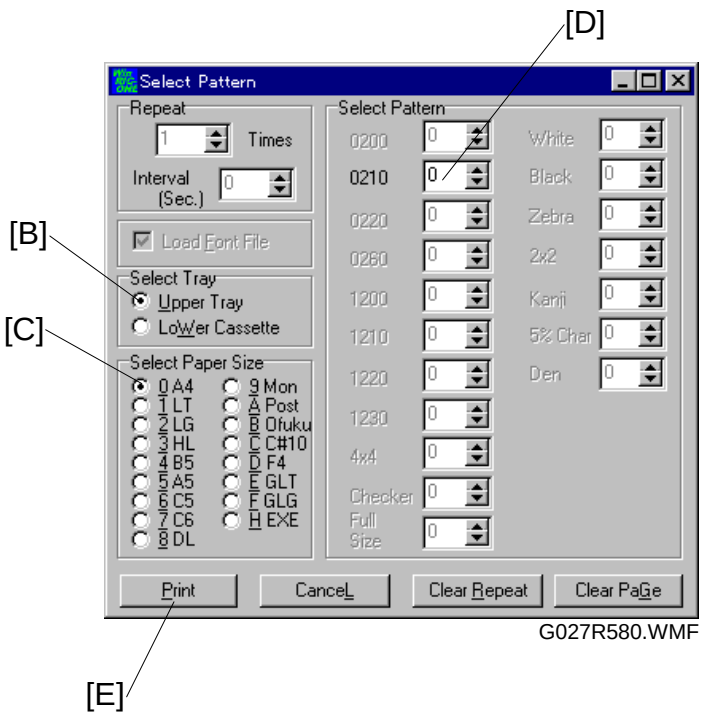
NOTE: Carefully read the “readme.txt” file that comes with the WinRICOHE program.

Procedure:

1. Start up WinRICOHE on the personal computer and click “Ricohe” [A] on the display.
2. Select “Upper Tray” [B] under “Select Tray” and “A4” or “LT” [C] under “Select Paper Size”.
3. Set “1” in the box next to pattern 0210 [D] under “Select Pattern” and click “Print” [E].



G027R579.WMF



G027R580.WMF

4. Measure “a” on the test print.
5. Adjust the registration to the standard amount by changing the setting of Service Switch 04. (Refer to Section 4.)

G027R576.WMF

The changed value will not be registered until the main switch is turned off and on.

6.6.2 READ START TIMING (FLATBED) AND CCD UNIT STOP POSITION (ADF) ADJUSTMENT (G027 ONLY)

Adjustment Standard:

2 ± 0.5 millimeters

Adjustment Tool:

Service Switch 0A:
Start timing for scanning documents in flatbed mode —count starts when the CCD unit leaves the reading stand-by position. (51 (H) to AF (H), 0.04242 millimeter/unit)

Service Switch 0B:
CCD unit stop position in ADF mode (51 (H) to AF (H), 0.04242 millimeter/unit)

The factory settings of Service Switches 0A and 0B are on the “System Parameter List”.

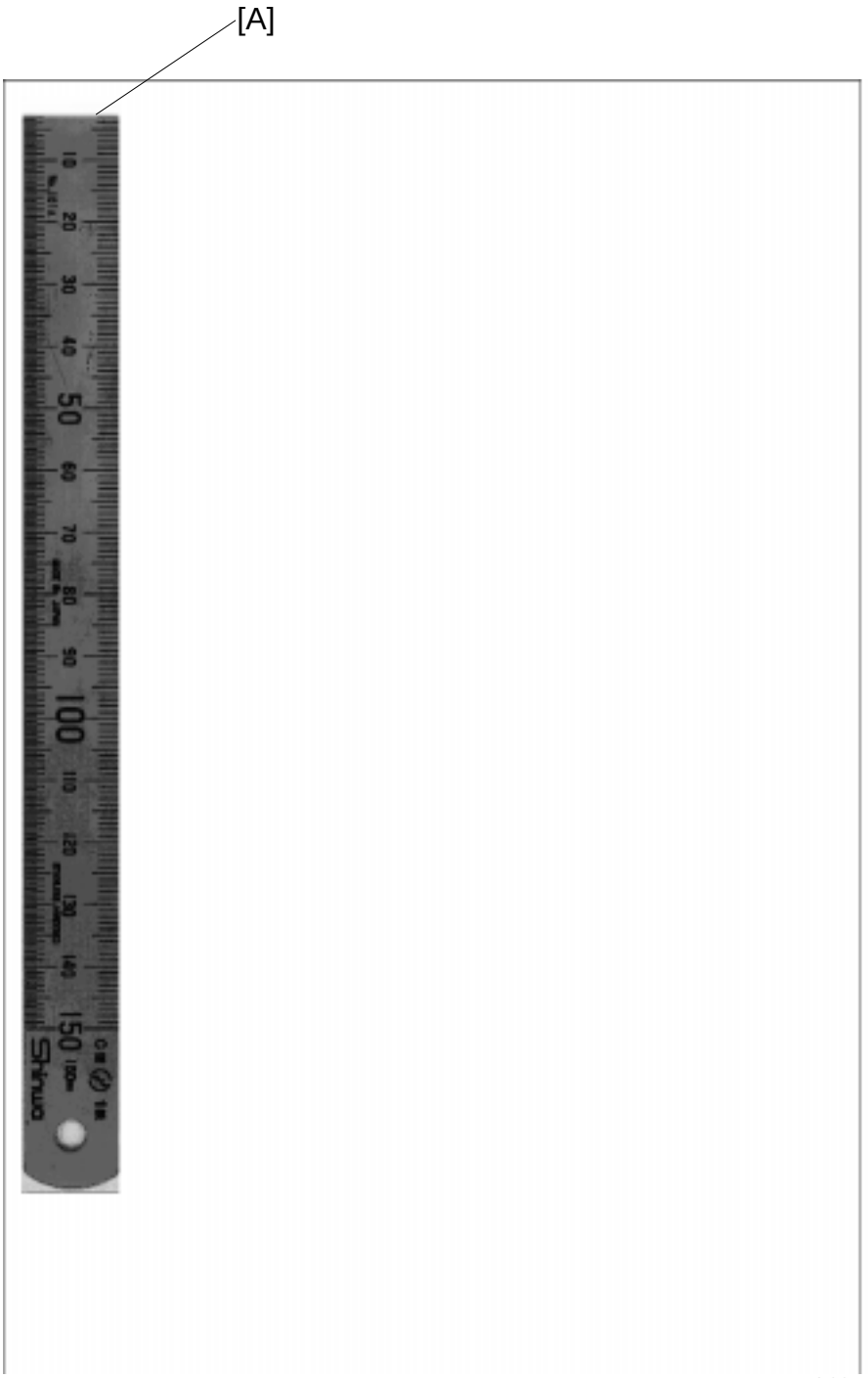
Procedure:

1. Adjust the registration.
2. Place a 150-millimeter scale against and parallel to the right scale on the exposure glass and place a sheet of paper beside the scale.

You must use a scale with measurement marks starting exactly on the edge.

3. Make copies in “photo 2” mode with the platen cover open.
4. Measure the scale [A] starting point.
5. Adjust the start timing for the flatbed scan to the standard amount by changing the setting of Service Switch 0A. (Refer to Section 4.)
6. Set service switch 0B to the same value as Service Switch 0A.

The changed value will not be registered until the main switch is turned off and on.



G027R577.WMF

6.6.3 READ START POINT OF HORIZONTAL SCANNING ADJUSTMENT (FLATBED AND ADF) (G027 ONLY)

Adjustment Standard:

2 ± 0.5 millimeters

Adjustment Tool:

Service Switch 08:
Starting point for horizontal scanning in ADF mode.
00 (H) to FF (H), 1 dot / unit (0.0847 millimeters / unit)

Service Switch 0F:
Starting point for horizontal scanning in flatbed mode.
00 (H) to FF (H), 1 dot / unit (0.0847 millimeters / unit)

The factory setting of Service Switch 08 is on the “System Parameter List”.

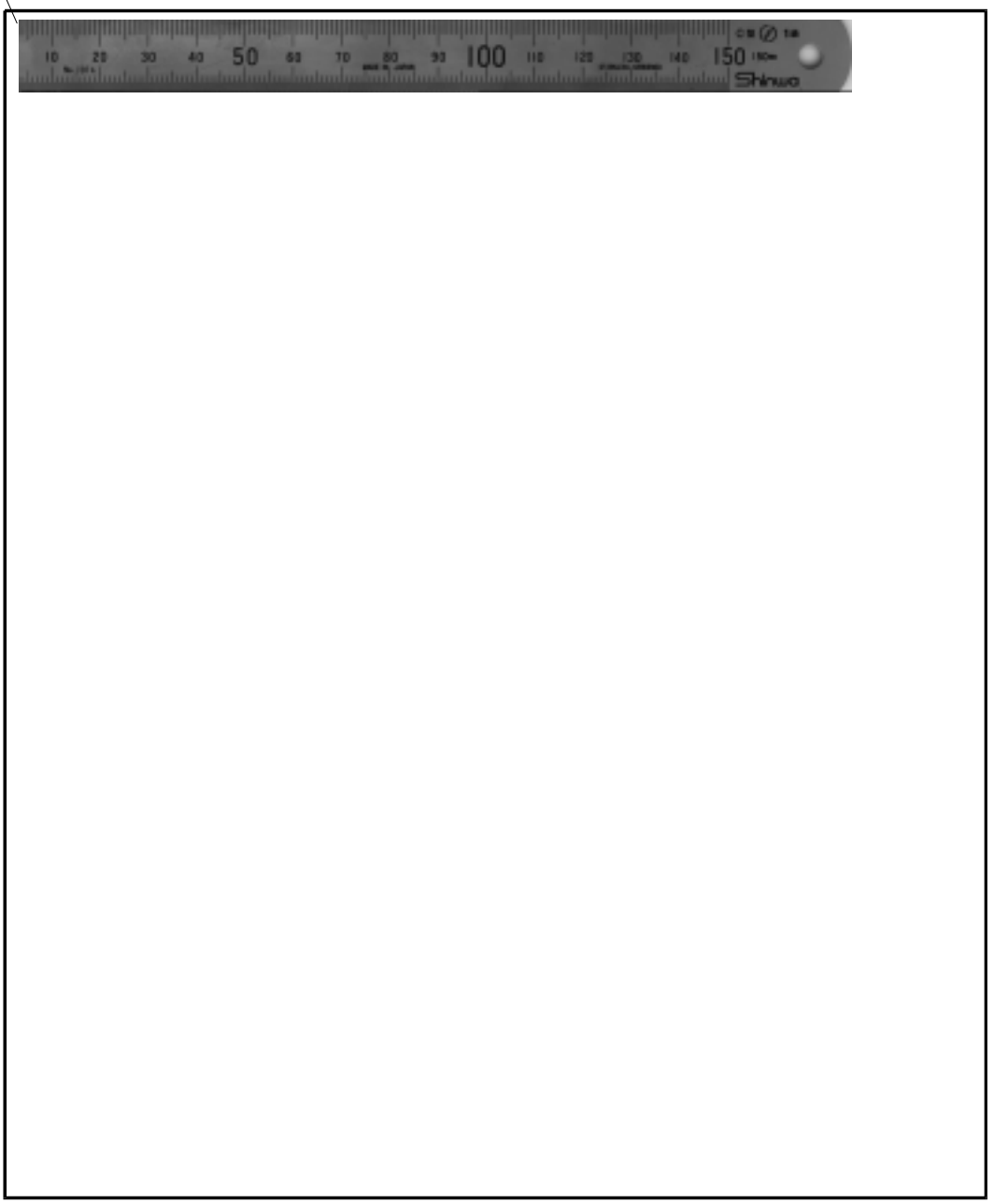
Procedure:

1. Adjust the registration.
2. Adjust the read start timing (flatbed) and CCD unit stop position (ADF).
3. Place a 150-millimeter scale against and perpendicular to the right scale on the exposure glass and place a sheet of paper beside the scale.

You must use a scale with measurement marks starting exactly on the edge.

4. Make copies in “photo 2” mode with the platen cover open.
5. Measure the starting point of the scale [A].
6. Adjust the flatbed starting point for horizontal scanning to the standard by changing the setting of Service Switch 0F. Then set Service Switch 08 to the same value. (Refer to Section 4.)

The changed value will not be registered until the main switch is turned off and on.



G027R578.WMF

6.6.4 FIRMWARE UPDATING

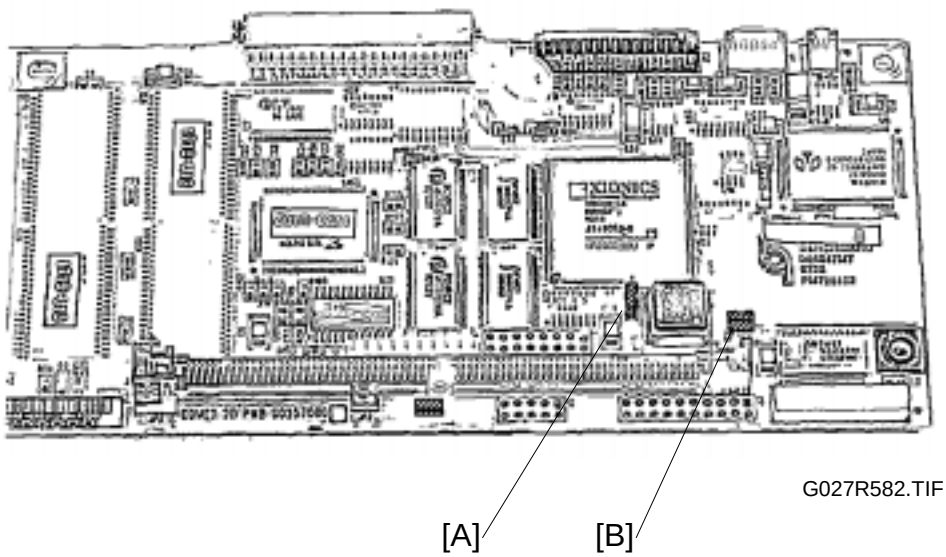
Tool:

Personal computer (with Windows 95 or 98 installed.)
WinRICOHE

Procedure:

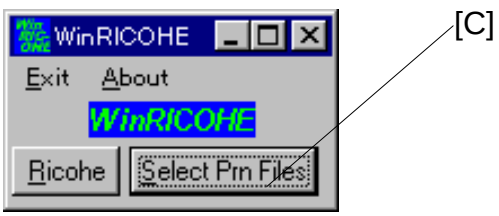
CAUTION: Do not turn off the power while “Please wait” or “Registered” is displayed.

1. Print out the system parameter list. (Refer to the section 4.)
2. Turn off the main switch and then remove the SIMM from the control board.
3. Short JP4 [A] and JP7 [B] on the control board.



G027R582.TIF

4. Reinstall the SIMM on the control board.
5. Turn on the main switch.
   After turning on the switch, the alarm beeps a few times, then the second printer LED blinks and no messages are displayed on the operation panel.
6. Start up WinRICOHE on a personal computer and click “Select Prn Files” [C] on the display.



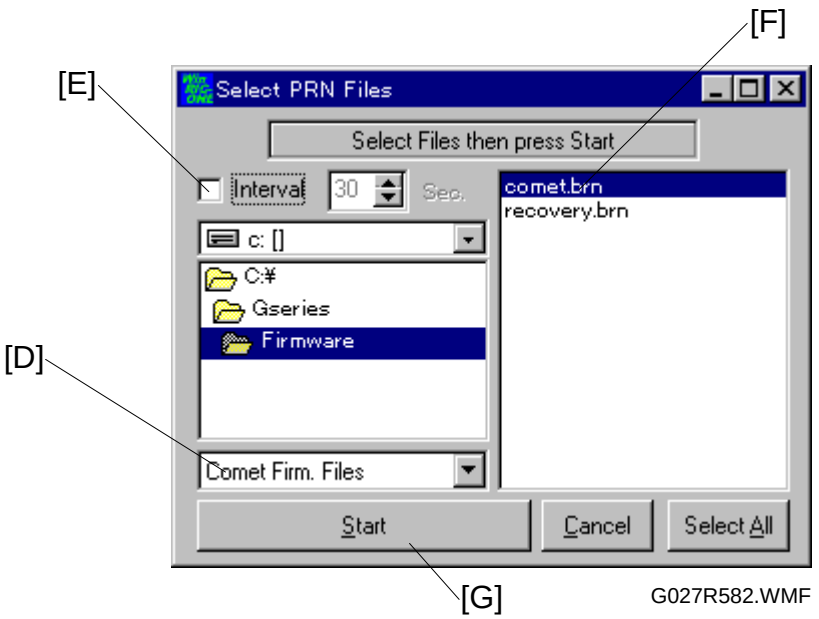
G027R579.WMF

Select “Comet Firm Files” [D] from the file types and remove the checkmark next to “Interval” [E].

7. Open the folder that contains the new firmware file.
8. Select the new firmware file [F]. (In this case comet.brn.)
9. Click “Start” [G].

NOTE: After clicking “Start”, the start key changes to a counter and indicates the number of completed steps for the new firmware installation. (It takes about 2 minutes.)

NOTE: After clicking “Start”, the alarm beeps a few times. During counter tabulation, the “Lighter” LED blinks.



NOTE: When updating is finished, the alarm beeps a few times, the “Lighter” LED lights, and the counter changes back to “Start”

11. After the counter changes back to “Start”, wait at least 15 seconds. Then, turn off the main switch.
12. Return JP4 and JP7 to the open condition.
13. Turn on the main switch.
14. Execute RAM clear. (Select RAM CLEAR 1. Refer to section 4.)
    NOTE: Do not turn off or operate the machine for 2 minutes after clearing RAM.
15. Turn the main switch off and on.
16. Do the registration and read start timing adjustments.
17. Turn the main switch off and on.
    Check all settings by printing out the system parameter list if necessary.

6.6.5 FIRMWARE RECOVERY

Tools:

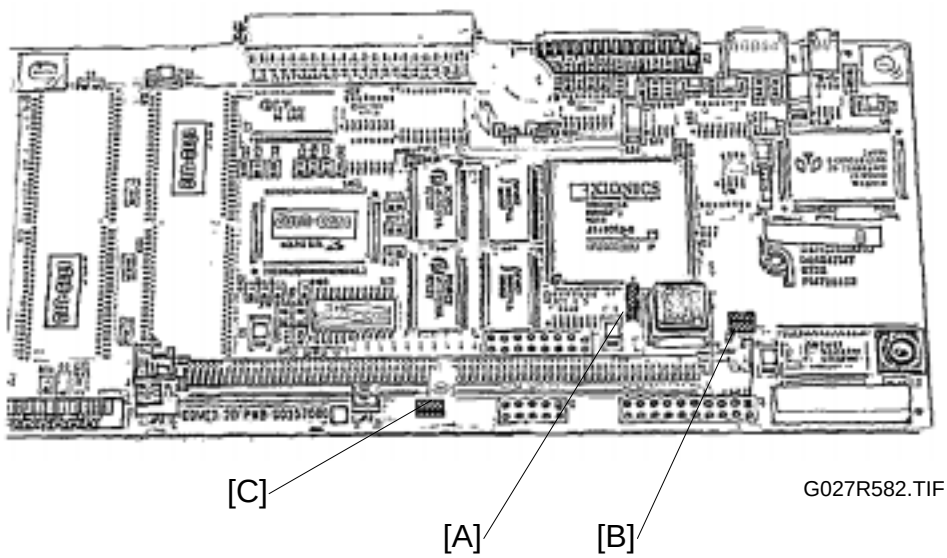
Personal computer (with Windows 95 or 98 installed)
WinRICOHE

Procedure:

CAUTION: Do not turn off the power while “Please wait” or “Registered” is displayed.

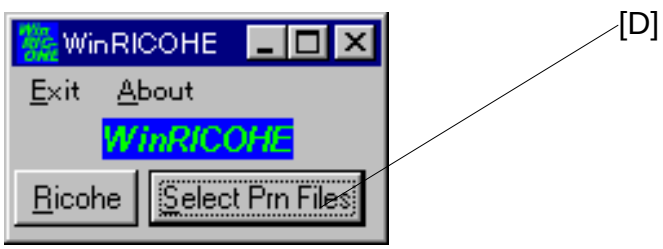
1. Turn off the main switch and then remove the SIMM from the control board.
2. Short JP4 [A], JP7 [B], and JP2 [C] on the control board.

NOTE: There is no shorting pin for JP2 on the board. It must be prepared in advance.



G027R582.TIF

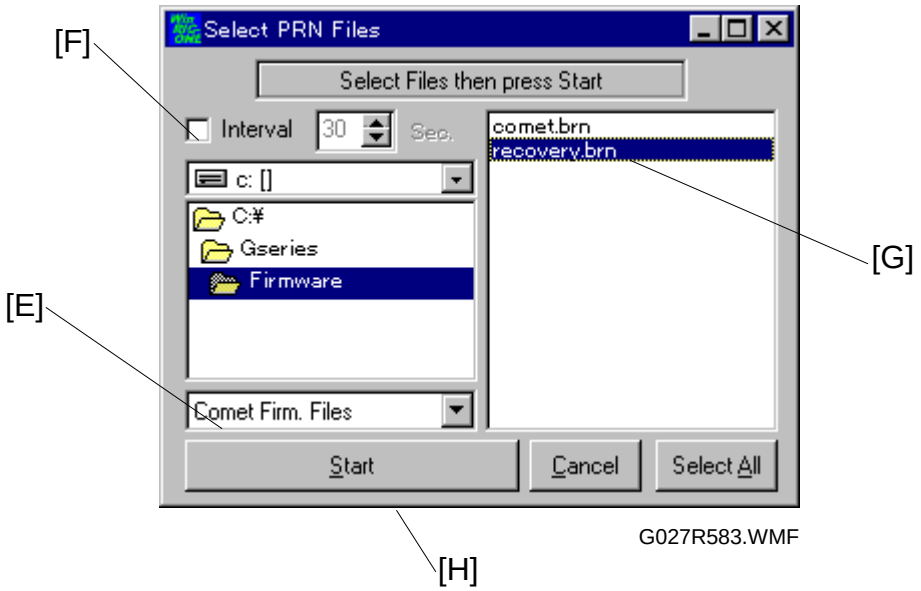
3. Reinstall the SIMM on the control board.
4. Turn on the main switch.
   After turning on the switch, wait at least 15 seconds.
5. Start up WinRICOHE on the personal computer and click “Select Prn Files” [D] on the display.



WINRICOHE.WMF

6. Select “Comet Firm Files” [E] from the file types and remove the checkmark next to “Interval” [F].
7. Open the folder that contains the recovery firmware file.
8. Select the recovery file [G].
9. Click “Start” [H].

After clicking “Start”, the start key changes to a counter and indicates the number of completed steps as the firmware is recovered. (This takes about 1 minute.)



G027R583.WMF

10. After the counter changes back to “Start”, wait at least 15 seconds. Then, turn off the main switch.
11. Return JP2 to the open condition.
12. Turn on the main switch.
13. Execute ‘Firmware Updating’.

6.6.6 ADDITIONNAL MODULE UPDATE

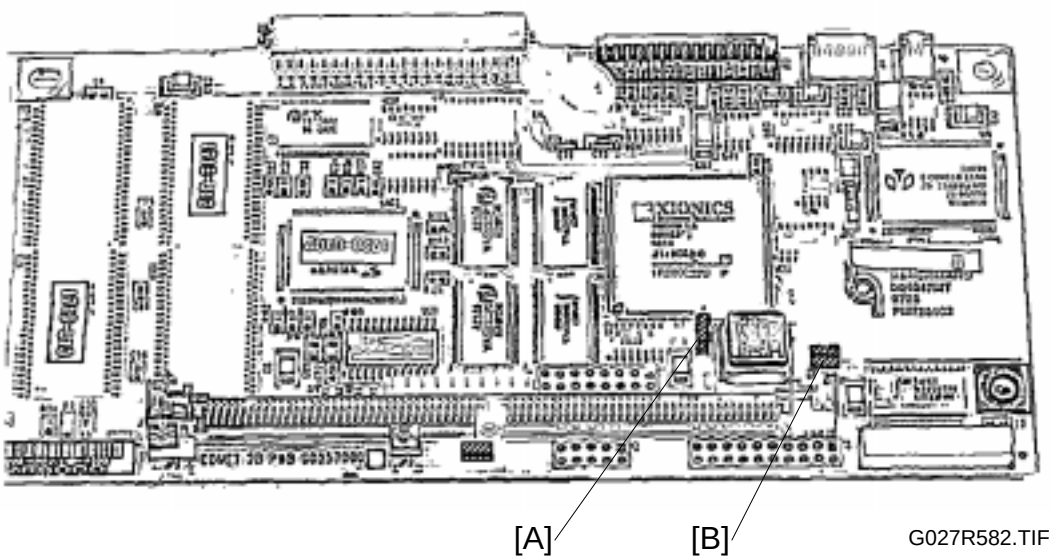
Tool:

Same as 'Firmware Updating'

Procedure:

CAUTION: Do not turn off the power while "Please wait" or "Registered" is displayed.

1. Print out the system parameter list. (Refer to section 4.)
2. Turn off the main switch and then remove the SIMM from the control board.
3. Short JP4 [A] and JP7 [B] on the control board.



G027R582.TIF

4. Reinstall the SIMM on the control board.
5. Turn on the main switch.
   After turning on the switch, the alarm beeps a few times, the second printer LED blinks, and no messages are displayed on the operation panel.
6. Start up WinRICOHE on a personal computer and click "Select Prn Files" [C] on the display.

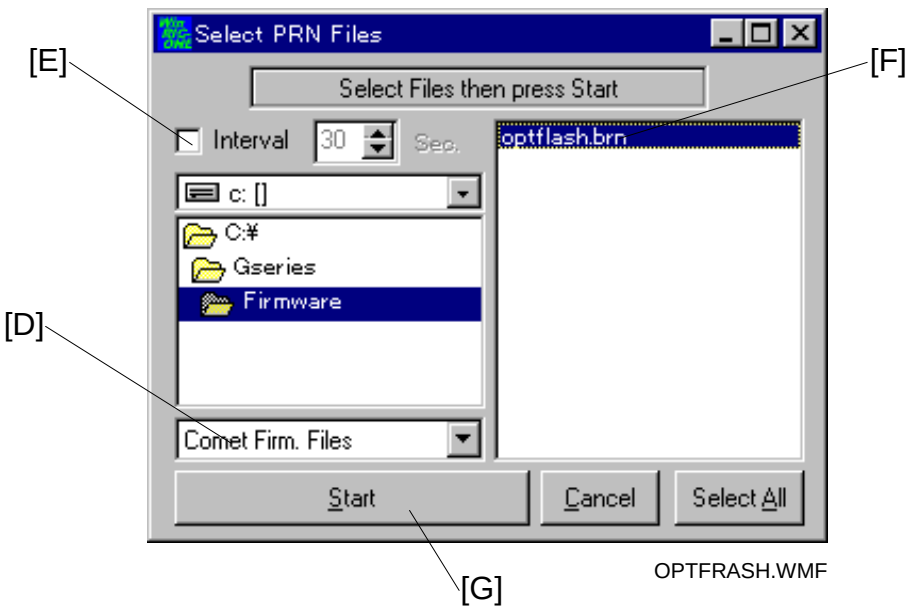
WINRICOHE.WMF

Select “Comet Firm Files” [D] from the file types and remove the checkmark next to “Interval” [E].

7. Open the folder that contains the new firmware file.
8. Select the new additional module file [F]. (In this case optflash.brn.)
9. Click “Start” [G].

NOTE: After clicking “Start”, the Start key changes to a counter and indicates the number of completed steps as the new additional module is installed. (This takes about 20 seconds.)

NOTE: After clicking “Start”, the alarm beeps a few times. During the counter tabulation, the “Lighter” LED blinks.



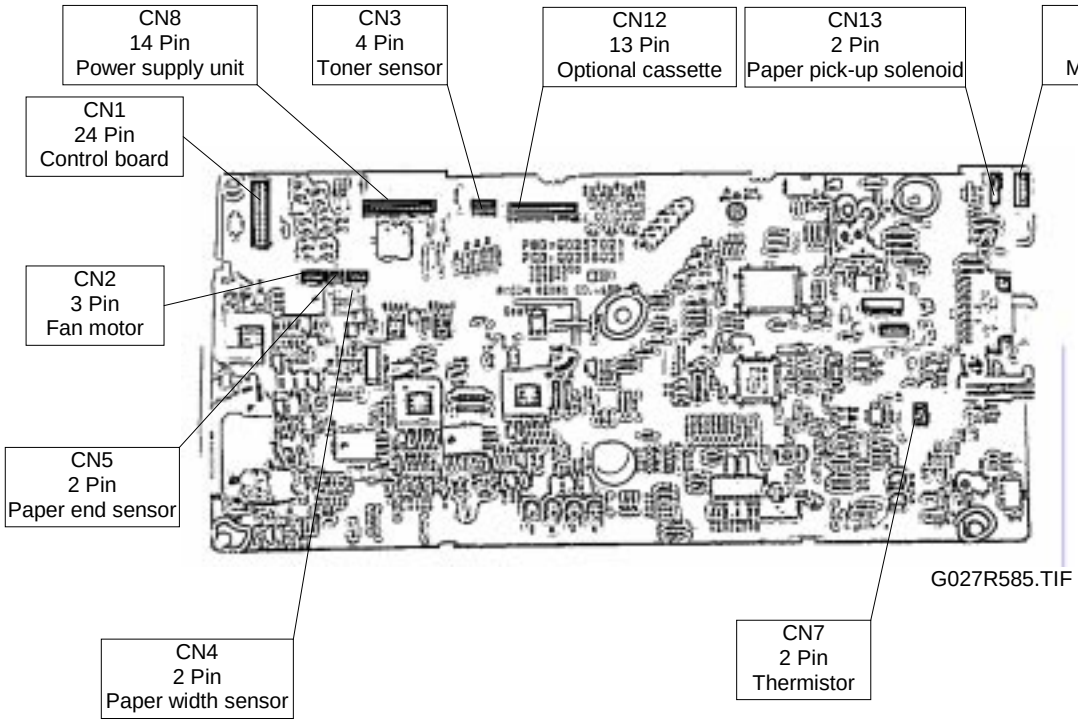
OPTFRASH.WMF

NOTE: When the updating is finished, the alarm beeps a few times, the “Lighter” LED lights, and the counter changes back to “Start”

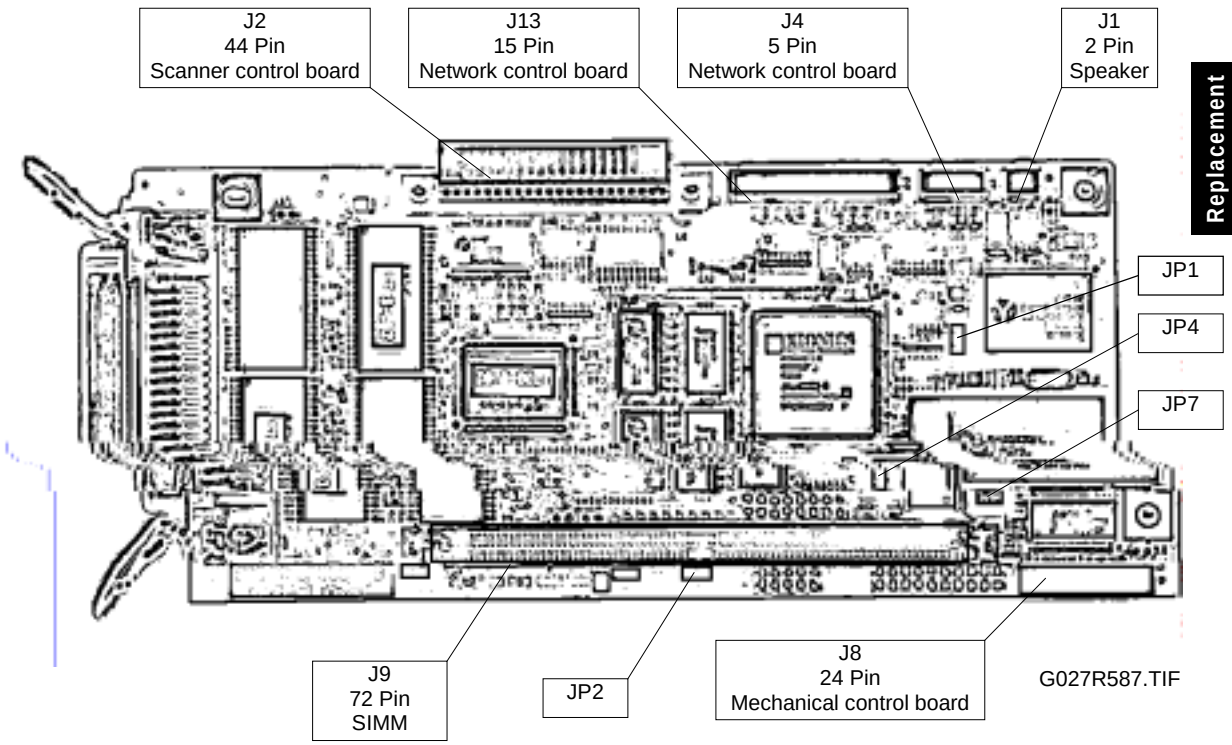
12. After the counter changes back to “Start”, wait more than 15 seconds. Then, turn off the main switch.
18. Return JP4 and JP7 to the open condition.
19. Turn on the main switch.
20. Execute RAM clear. (Select RAM CLEAR 1. Refer to section 4.)
    NOTE: Do not turn off or operate the machine for 2 minutes after clearing RAM.
21. Turn the main switch off and on.
22. Do the registration adjustment and the read start timing adjustment.
23. Turn the main switch off and on.
    Check all settings by printing out the system parameter list if necessary.

6.7 CONNECTOR LAYOUT

6.7.1 MECHANICAL CONTROL BOARD

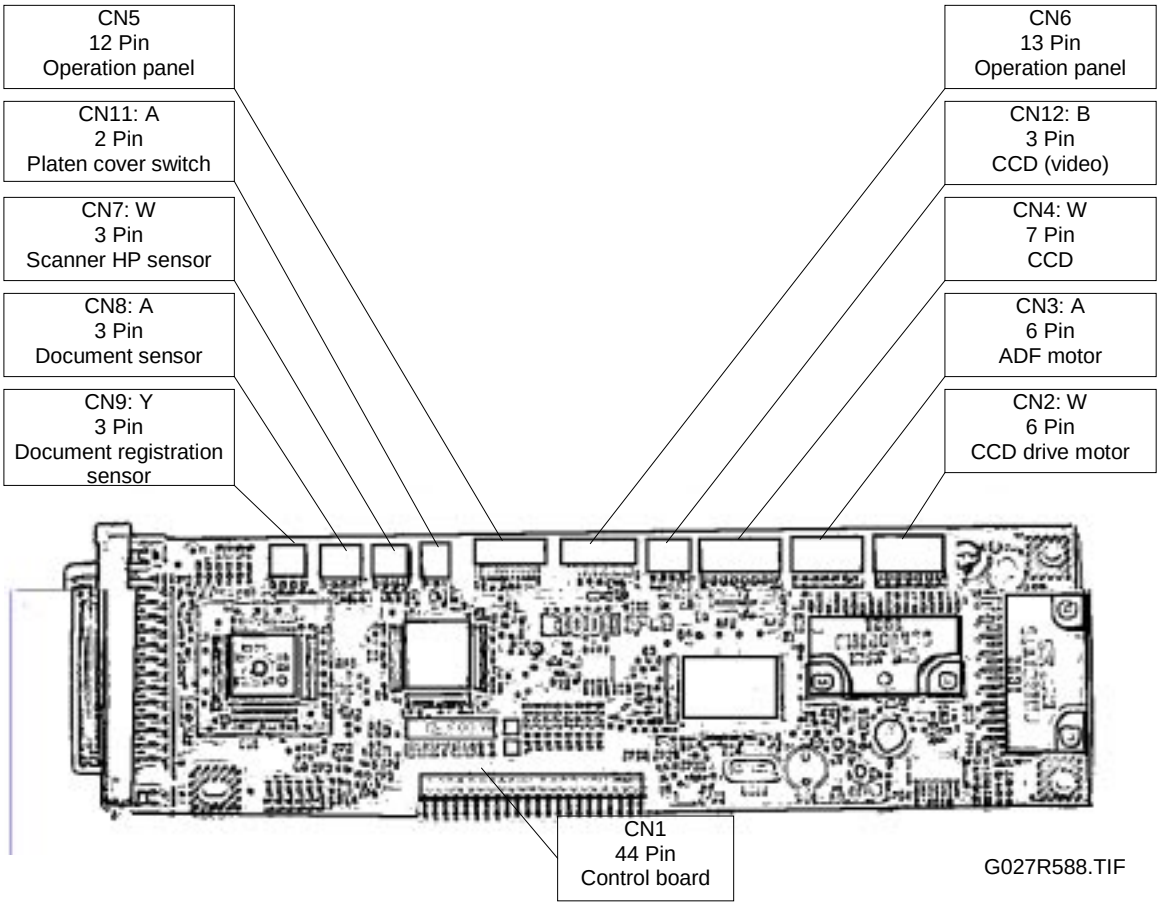


6.7.2 CONTROL BOARD

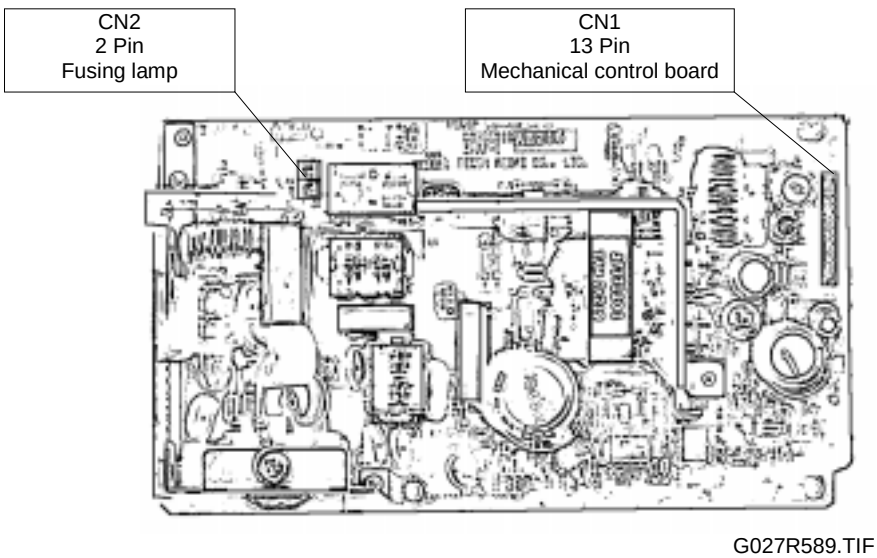


Replacement Adjustment

6.7.3 SCANNER CONTROL BOARD



6.7.4 POWER SUPPLY UNIT



7. TROUBLESHOOTING

7.1 COPY QUALITY TROUBLESHOOTING

If there is a copy quality problem that cannot be solved easily, try using the following troubleshooting procedures, while referring to the point to point diagram. The procedures are not exhaustive, but they may help you to find the problem.

1. Make a flatbed or ADF scanner copy.
2. If the print image is OK, check the PC system and PC cable.
3. If the print image is not OK, output the system parameter list (service parameter 81) as a test pattern.
4. If the print image is OK, check the scanning-related parts of the machine (upper unit).
5. If the print image is not OK, replace the toner cassette; then output the system parameter list.
6. If the print image is not OK, check the printing-related parts of the machine (lower unit).

7.1.1 BLANK COPIES

Possible Cause (Scanner):

- When the CCD unit does not move and “Error 90” is displayed (G027 only):
  -Malfunction in the CCD unit drive mechanism
- When the CCD unit moves then stops at the front side and “Error 90” is displayed (G027 only):
  -Defective CCD unit home position sensor
- When the CCD does not move (G027 only) and no error code is displayed:
  -Defective the CCD unit control
  -Defective video signal path
- Defective scanner control board

Action:

1. Check that all the connectors between the scanner board and other components are set correctly. (Refer to the point-to-point diagram.)
2. Replace any defective parts.

Possible Cause (Printer):

- Defective toner cassette
- Defective laser unit
- The proper bias voltages are not applied to the toner application roller and/or the development roller.
- The proper current is not applied to the transfer roller.
- Defective mechanical control board

Action:

1. While printing the system parameter list, open the upper cover and check if there is a toner image on the drum surface.
2. Make sure that the transfer roller is correctly installed.
3. Make sure that the bias voltages for the toner application roller and/or the development roller are properly supplied.
4. Make sure that there is proper contact between the toner cassette terminals and the mechanical control board.

   NOTE: Use the following procedure to check the bias voltages for the toner application roller and the development roller.
   1) Open the upper cover and turn on the power.
   2) Remove the toner cassette.

3) Push the interlock switch actuator.
4) During power-on initializing, check the bias voltages at each terminal with a digital multi-meter.

The specified voltages are as follows:
Toner application bias:-650 V
Development bias: -400 V $\rightarrow$ +250 V
Charge voltage: -1200 V

5. Check that the laser unit is properly positioned and that there are no obstructions in the laser path.

7.1.2 BLACK COPIES

Possible Causes (Scanner)

- Defective CCD unit
- Defective scanner control board (SCB)

Action:

1. Check the connection between the SCB (CN12, CN4) and the scanner junction board (SJB) (CN1,CN3).
2. Check the connection between the SJB (CN2) and the CCD unit.
3. Check that the LED array is working properly in copy mode.

Possible Causes (Printer)

- Defective toner cassette
- Charge is not properly applied.
- Defective laser unit
- Defective mechanical control board (MCB)

Action:

1. Check that the charge voltage is properly supplied. (Refer to Section 7.1.1—Blank Copies.)
2. Check the connections between the charge terminal and the terminal on the MCB.
3. Check the connectors for the laser unit.

7.1.3 DIRTY BACKGROUND

G027T502.WMF

G027T503.WMF

Possible Cause (Scanner)

- Scanner shading correction error or incorrect threshold level.

Action:

1. Clean the shading plate.

Possible Causes (Printer)

- Defective toner cassette
- The charge voltage is not properly supplied.
- The hot roller is dirty.
- Defective mechanical control board (MCB)

Action:

1. Check that the charge voltage is properly supplied. (Refer to Section 7.1.1—Blank Copies.)
2. Check the connections between the charge terminal and the terminal on the mechanical control board (MCB).
3. Check whether the hot roller surface or cleaning pad is dirty.

7.1.4 UNEVEN IMAGE DENSITY

G027T504.WMF

G027T503.WMF

Possible Causes (Scanner)

- Defective CCD unit

Action:

1. Check the connections between the scanner control board (SCB) (CN12, CN4) and the SJB (CN1, CN3).
2. Check the connections between the scanner junction board (SJB) (CN2) and the CCD unit.
3. Check that the LED array is working properly in copy mode.

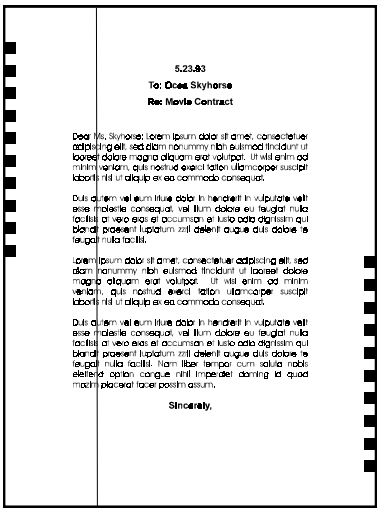
Possible Causes (Printer)

- Defective toner cassette
- Dirty or damaged transfer roller
- Dirty or defective laser unit
- Damp paper was used.

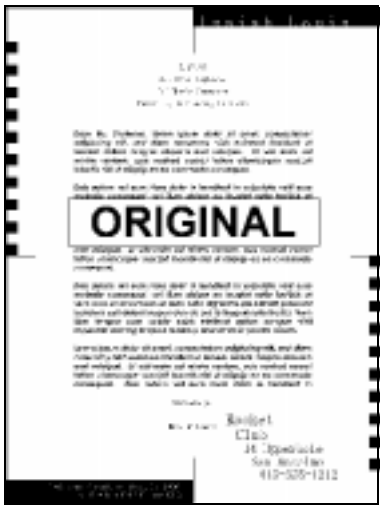
Action:

1. Make a copy with the platen cover open, and open the upper cover in the middle of printing (G027 only).
2. Make a copy, and open the front cover in the middle of printing (G027 only).
3. Check if the toner is evenly distributed on the drum.
   - If it is not, check the laser optic components.
   - If it is, check if there is any contamination on the transfer roller surface.

7.1.5 VERTICAL BLACK LINES



G027T505.WMF



G027T503.WMF

Possible Causes (Scanner)

When the problem occurs during flatbed copying mode (G027 only):
-Defective CCD unit

- When the problem occurs during only ADF copying mode:
  -Dust or scratches on the ADF paper guide
  -Dirty white plate in the ADF

NOTE: The G025 model does not have flatbed equipment. If the paper guide or the white plate is not dirty, the CCD unit might be defective.

Action:

1. Clean the paper guide and the shading plate (ADF).
2. Replace the CCD unit.

Possible Causes (Printer)

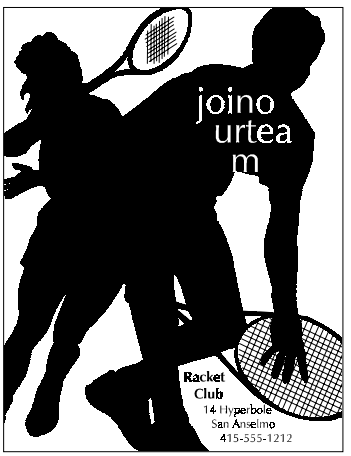
- Defective toner cassette
- Dirt or scratches on the hot roller surface
- Dirty hot roller strippers

Action:

1. Clean or replace the hot roller.
2. Clean or replace the hot roller strippers.

7.1.6 HORIZONTAL BLACK LINES

G027T506.WMF



G027T507.WMF

Possible Cause (Printer):

- Defective toner cassette

Action:

- Check that the surface of the drum is not damaged.

7.1.7 VERTICAL WHITE LINES

G027T508.WMF

G027T503.WMF

Possible Cause (Scanner):

- Defective CCD unit

Action:

- Replace the CCD unit.

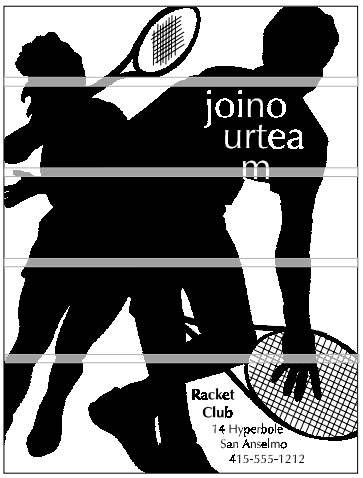
Possible Causes (Printer):

- Defective toner cassette
- The laser optic components are dirty.
- The transfer roller surface is dirty or damaged.
- The hot roller strippers scrape toner off the printout.

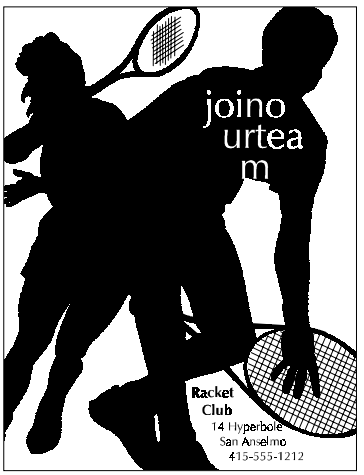
Action:

1. Check the following components. Then clean or replace them if necessary.
   - Laser optic components
   - Transfer roller
   - Hot roller strippers

7.1.8 HORIZONTAL WHITE LINES



G027T509.WMF



G027T507.WMF

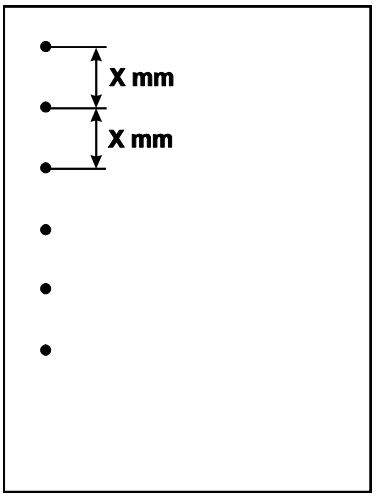
Possible Causes (Printer):

- Defective toner cassette
- The development bias is not stable.
- Transfer current is not stable.
- Defective mechanical control board (MCB)

Action:

1. Check the development bias. (Refer to Section 7.1.1 Blank Copies.)
2. Check that the transfer roller is positioned correctly.
3. Check the connections between the development bias and charge terminals and the terminals on the MCB.

7.1.9 BLACK DOTS/SPOTS



G027T510.WMF

Possible Cause (Scanner):

- Dust on the exposure glass (the dots appear irregularly) (G027 only)

Action:

- Clean the exposure glass (G027 only).

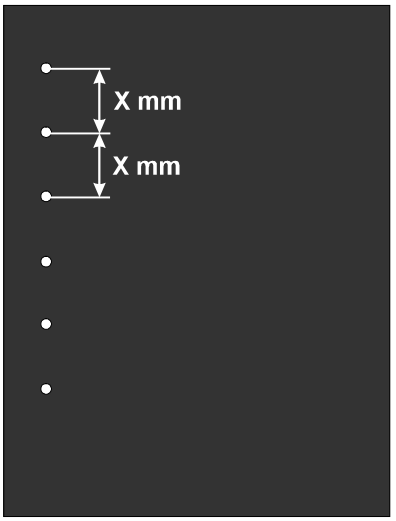
Possible Causes (Printer):

- Defective toner cassette
- The drum surface is damaged. (This is likely if the dots appear at 75.4-millimeter intervals.)
- The hot roller surface is damaged. (This is likely if the dots appear at 62.8-millimeter intervals.)

Action:

1. Replace the defective component (hot roller or toner cassette).

7.1.10 WHITE SPOTS IN BLACK IMAGE AREAS



G027T511.WMF

Possible Causes (Printer):

- The drum surface damaged. (This is likely if the dots appear at 75.4-millimeter intervals.)
- The transfer roller surface is damaged. (This is likely if the dots appear at 44-millimeter interval.)

Action:

1. Replace the defective component (transfer roller or toner cassette).

7.1.11 FAINT COPIES

G027T512.WMF

G027T503.WMF

Possible Causes (Scanner):

- Dirty shading plate and/or exposure glass (G027 only)
- Defective CCD unit

Action:

- Clean the white plate (for both book and ADF modes).
- Clean the exposure glass (G027 only).

Possible Causes (Printer):

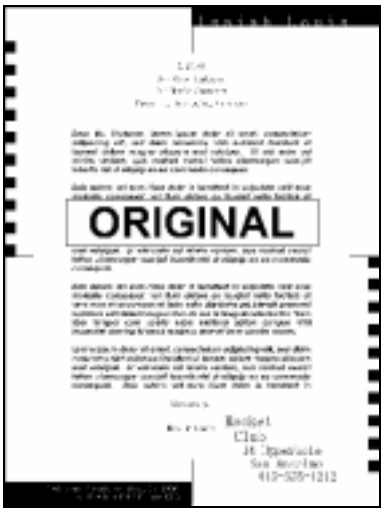
- Defective toner cassette
- Dirty laser optic components
- Incorrect development/transfer bias
- Damp paper was used.

Action:

1. Check whether toner saving mode was selected using the user parameters. (If it was, this is not the problem.)
3. Copy a test pattern, and open the cover in the middle of printing. Then, check if the toner on the drum looks faint.
4. Check if the laser optic components are dirty.
5. Check the connections between the transfer bias terminal and mechanical control board (MCB).
6. Check all the connections between the bias terminals and the MCB.

7.1.12 VERTICAL BLACK STREAKS

G027T513.WMF



G027T503.WMF

Possible Cause (Scanner):

- Dirty exposure glass (G027 only)

Action:

- Clean the exposure glass.

Possible Cause (Printer):

- Defective toner cassette

Action:

- Replace the toner cassette.

7.1.13 UNFUSED COPIES

Possible Cause (Printer):

- The thermistor is defective.
- The fusing pressure roller spring mechanism is defective.
- The wrong type of toner cassette is being used.
- A non-recommended type of paper is being used.

Action:

1. Check with recommended types of paper and toner.
2. Replace any defective parts.

7.1.14 GHOST IMAGE

Possible Causes (Printer):

- Defective toner cassette
- Defective fusing thermistor
- Dirty hot roller

Action:

1. Check the hot roller surface and the cleaning pad.
2. Check the fusing thermistor.
3. Replace any defective parts.

7.1.15 TONER ON THE BACK OF THE PRINTOUT

Possible Causes (printer):

- Dirty transfer roller
- Dirty fusing pressure roller

Action:

1. Check if the transfer roller is dirty with toner, and clean or replace it if necessary.
2. Check if the fusing pressure roller is dirty with toner.
   - If it is, clean the fusing pressure roller.
   - If not, check for any other dirty rollers and clean them.

7.1.16 MISALIGNED OUTPUT (IMAGE SHIFTED TO THE RIGHT OR LEFT)

Possible Causes (Scanner):
- Incorrect setting of the document guide
- Improper setting of the starting point for horizontal scanning

Action:
- Set the document guide correctly.
- Check the read starting point and adjust if necessary. (Refer to Section 6.7.)

Possible Cause (Printer):
- Incorrect setting of the paper guide

Action:
- Set the paper guide correctly.

7.1.17 MISALIGNED OUTPUT (IMAGE SHIFTED VERTICALLY)/SHRUNKEN IMAGE

Possible Cause (Scanner)
- Incorrect setting of the read start timing

Action:
- Check the read start timing and adjust if necessary. (Refer to Section 6.7.)

Possible Causes (Printer)
- Improper print registration setting
- Dirty paper feed roller

Action:
- Check the print registration setting and adjust if necessary. (Refer to Section 6.7.)
- Clean the paper feed roller.

7.2 MECHANICAL PROBLEMS

7.2.1 ADF NON-FEED

Possible Causes:

- An unsuitable document type or size, or curled document is used.
- The pick-up and feed rollers are dirty or worn out.
- Defective ADF motor
- Defective platen cover switch (G027 only)
- Defective document sensor
- Defective scanner control board (SCB)

Action:

1. Check that a suitable type of document is used.
2. Check the following.
   - Clean the pick-up and feed rollers with a soft cloth and water. Replace them if they are damaged.
   - Check that the ADF motor works correctly.
   - Check the connection between the SCB (CN3) and the ADF motor.
   - Check that the platen cover switch is working properly. Replace it if it is damaged (G027 only).
   - Check that the document sensor is working properly. Replace it if it is damaged.

7.2.2 ADF JAM

Possible Causes:

- An unsuitable type or size of document is used.
- The document is too long.
- The ADF rollers (pick-up, feed, feed-in and feed-out) are dirty.
- Obstruction in the document paper path.
- Defective ADF motor
- Defective document sensor
- Defective registration sensor

Action:

1. Check if a suitable type of document is used and that the document length is within the maximum setting.
2. Check for obstructions in the paper path.
3. If the problem still remains, do the following.
   - Clean the rollers with a soft cloth and water. Replace them if they are damaged.
   - Check that the ADF motor works correctly
   - Check that the document and registration sensors are working properly. Replace them if they are damaged.

7.2.3 ADF SKEW

Possible Causes:

- An unsuitable document type or size is used.
- The document guide is not set properly.
- The scanner rollers (pick-up, feed, feed-in, and feed-out) are dirty.
- Obstruction in the document paper path

Action:

1. Check that a suitable type of document is used.
2. Check that the ADF cover is securely closed, and check that the document guide is properly set. Also, check that the ADF roller assembly is properly installed.
3. Check for obstructions in the paper path.
4. Clean the rollers with a soft cloth and water, and replace them if they are damaged.

7.2.4 ADF MULTI-FEED

Possible Causes:

- An unsuitable document type or size is used.
- The separation tab is worn or dirty.

Action:

- Clean or replace the separation tab.
- Check that the spring under the separation tab is properly installed.

7.2.5 SCANNER HOME POSITION ERROR (ERROR CODE 90) (G027 ONLY)

Possible Causes:

- The CCD unit lock is at the lock position. (This lock should be unlocked at installation.)
- The CCD unit drive belt is out of position.
- The CCD unit drive belt is damaged or broken.
- Malfunctions in the CCD unit drive components (e.g. sensor, motor)
- Obstructions in the CCD unit drive path

Action:

- Check that the CCD unit drive components are in the correct position.
- Check that the CCD unit drive belt is positioned correctly.
- Check for obstructions in the CCD unit drive path.
- Check that the spring that secures the drive belt to the CCD unit is working properly, and replace if it is damaged.
- Check that the CCD unit lock is unlocked.

7.2.6 PAPER NON-FEED (PRINTER)

Possible Causes:

- A non-recommended paper type is used.
- Malfunction in the paper pick-up cam and pick-up solenoid.
- Paper feed roller not properly set.
- The friction pad spring is not properly set.
- Obstructions in the paper path
- Defective paper pick-up drive mechanism
- Defective mechanical control board (MCB)

Action:

1. Make sure that the correct type of paper is being used.
2. Make sure that the paper tray is correctly set.
3. Make sure that the paper pick-up mechanism works correctly.
4. Make sure that the paper feed roller is installed properly. Clean or replace if necessary.
5. Check if there are any obstructions in the paper feed path.
6. Make sure that all the gears are installed properly.
7. Check the connections between the MCB (CN13) and the paper pick up solenoid.

7.2.7 PAPER JAM (REGISTRATION AREA)

Possible Causes:

- A non-recommended type of paper is used.
- The paper feed roller is dirty.
- Defective registration sensor
- Obstruction in the paper path
- Defective mechanical control board (MCB)

Action:

1. Make sure that the correct type of paper is being used, and that the paper tray and guide are positioned correctly.
2. Check for obstructions in the paper path.
3. Check the paper feed roller and its mechanism. Clean or replace if necessary.
4. Make sure that the registration sensor is working properly.
5. Check the fusing unit drive mechanism.

7.2.8 PAPER JAM (FUSING EXIT AREA)

Possible Causes:

- A non-recommended type of paper is used.
- Obstruction in the paper path
- Defective registration sensor
- Malfunctions in the fusing drive mechanism
- Defective paper feed exit sensor
- Malfunction in the hot roller stripper(s) mechanism
- Malfunction in the pressure mechanism in the fusing unit
- Defective mechanical control board (MCB)

Action:

1. Make sure that the correct type of paper is being used.
2. Check for obstructions in the paper path.
3. Make sure that the registration sensor is working correctly.
4. Check all the gears in the fusing drive mechanism.
5. Make sure that the paper feed-out sensor is working correctly.
6. Check the hot roller strippers and the pressure mechanism in the fusing unit.

7.2.9 PAPER SKEW (PRINTER)

Possible Causes:

- A non-recommended type of paper is used.
- Incorrect positioning of the paper guide in the upper paper tray
- The paper feed roller is worn out or damaged.
- Obstruction in the paper path
- Malfunction of the registration or paper exit sensor actuators
- Malfunctions in the pressure mechanism of the fusing unit

Action:

1. Make sure that the correct type of paper is used.
2. Make sure that the paper guide on the upper paper tray is positioned correctly.
3. Make sure that the paper feed roller is installed correctly, and clean or replace it if necessary.
4. Check for obstructions in the paper path.
5. Check the registration and paper exit sensor actuators.
6. Check the fusing unit's pressure mechanism.

7.2.10 PAPER MULTI-FEED (PRINTER)

Possible Causes:

- A non-recommended type of paper is used.
- The friction pad is dirty
- Malfunctions in the paper pick-up mechanism

Action:

- Check if a correct type of paper is used.
- Make sure that the paper guide is positioned correctly.
- Check the friction pad, and clean or replace it if necessary.
- Make sure that the paper pick-up mechanism works correctly.

7.3 ERROR CODES

These error codes are listed in the system parameter list.

Fatal errors

When a fatal error occurs, an error code is displayed in the LCD. (For example, “Error 59”.) The machine cannot clear fatal errors by turning the power off and on. A fatal error can be canceled using the RAM display/rewrite mode (Service function 82).

NOTE: Perform the following operation to cancel a fatal error.

1) Enter the RAM display/rewrite mode. (See 4.1: Service functions)
2) Select the hexadecimal display mode.
3) Set the address to “11111111”.
4) Press the Start key.
5) Move the cursor to the data area.
6) Change the value to “00”.
7) Press the Stop key.

Semi fatal errors

When a semi-fatal error occurs, an error code is displayed in the LCD. (For example: “Error 90”.) The machine will clear this error when the power is turned off and on.

Error	Error Type			Description	
Code	Error	Semi-fatal Error	Fatal Error		
01	✓			Too many errors	The other end sent an RTN after receiving a page, because there were too many errors
04	✓			Line disconnection	1. Line disconnected just after sending TCF 2. Line disconnected when sending the image data 3. No post-message command from the other end when receiving non-ECM data 4. No post-message response from the other end after a page was sent 5. EOR-NULL was sent 6. ERR was sent in response to the received EOR-NULL 7. ERR was sent in response to the received EOR-MSP

Error	Error Type			Description	
Code	Error	Semi-fatal Error	Fatal Error		
08	✓			CFR or FTT not received after modem training	DIS was received when the machine was waiting for CFR or FTT after modem training, because the other end could not receive DCS and TCF
09	✓			Training error	Unsuccessful after modem training at 2400 bps
13	✓			Modem shift down error	An unexpected response was received after sending a page and a post-message command
15	✓			Incompatible remote transmitter	An incompatible DCS was received from the other end
22	✓			Incompatible remote receiver	Transmission was discontinued because the end terminal did not have the receive function. (Bit 10 in the received DIS was 0.)
23	✓			Modem speed mismatch	The other end wanted to send a page at over 14400 bps.
26	✓			No post message	No post-message signal from the other end during reception
32	✓			Communication problem	1. EOR-EOP, EOR-MPS or EOR-EOM was sent 2. ERR was sent in response to a received EOR-EOP or EOM
33	✓			To many errors during reception	1. RTN was sent to the other end because, there were too many errors during reception. 2. Facsimile data not received in ECM reception.
34	✓			Remote rejected	An unauthorized sender tried to send a message if authorized reception is enabled.
40		✓		Serial error 1	Communication error in the serial signal between the control board and the SPCB.
41		✓		Serial error 2	Communication error in the serial signal between the control board and the MCB.
50	✓			Paper non-feed or jam before the registration sensor	Paper from the upper tray did not reach the registration sensor.
51	✓			Paper jam in the transfer area	Paper did not reach the fusing unit.

Error	Error Type			Description	
Code	Error	Semi-fatal Error	Fatal Error		
52	✓			Paper jam in the transfer area or inside the fusing unit	The registration sensor did not turn off, because the paper was too long.
53	✓			Paper jam in the fusing exit area	Paper jam in the fusing exit area.
54	✓			Paper non-feed or jam before the registration sensor	Paper from the lower tray did not reach the registration sensor.
55	✓			Upper cover open detected during printing	Detected that the upper cover was opened during printing.
56		✓		Laser diode failure	No laser beam output
57		✓		Polygonal mirror motor failure	Polygonal mirror motor did not rotate correctly.
58	✓			Toner end	Toner end was detected
59			✓	Fusing unit error	Fusing lamp at a high temperature during printing.
60			✓	Fusing unit error	Fusing lamp at a low temperature during printing.
61			✓	Fusing unit error	Fusing lamp not at the printing temperature after warm up.
62			✓	Fusing unit error	Fusing lamp at a high temperature for 300 seconds in power save mode.
63			✓	Fusing unit error	Fusing lamp at a high temperature for 20 seconds after detecting the proper temperature in power save mode.
64			✓	Fusing unit error	Fusing lamp at a high temperature in lower temperature waiting mode.
65			✓	Fusing unit error	Fusing lamp at a high temperature in higher temperature waiting mode.
66			✓	Fusing unit error	Fusing lamp at a low temperature in lower temperature waiting mode.
67			✓	Fusing unit error	Fusing lamp at a low temperature in higher temperature waiting mode.
68			✓	Fusing unit error	Fusing lamp at an extremely low temperature during printing.
69			✓	Fusing unit error	Fusing lamp at an extremely high temperature.
70			✓	Fusing unit error	Fusing lamp at a high temperature in lower temperature waiting mode.

Error	Error Type			Description	
Code	Error	Semi-fatal Error	Fatal Error		
71			✓	Fusing unit error	Fusing lamp at a high temperature in higher temperature waiting mode.
72			✓	Fusing unit error	Thermistor error
73			✓	Fusing unit error	Over the comparator's temperature limit (235ºC.)
74		✓		Power pack error	Charge voltage did not change from 0 to –1200 volts.
75		✓		Power pack error	Over voltage: > –1200 volts
76		✓		Power pack error	Transfer current did not increase to +3.5 μA.
77		✓		Power pack error	Transfer current too high: >+3.5 μA.
78		✓		Power pack error	Development bias voltage did not go to –400 volts, or application roller bias voltage did not go to -650 volts.
79		✓		Power pack error	Development bias over voltage: > –400 volts, or Application roller bias over voltage: > -650 volts
85			✓	Fusing unit error	Temperature too high while heating up.
86			✓	Fusing unit error	The temperature didn't go up while heating up.
90		✓		CCD unit home position error	When using the flatbed scanner, the carriage didn't move or home position sensor failure occurred.
91	✓			Document jam	Document non-feed
92	✓			Document jam	Document length exceeded maximum.

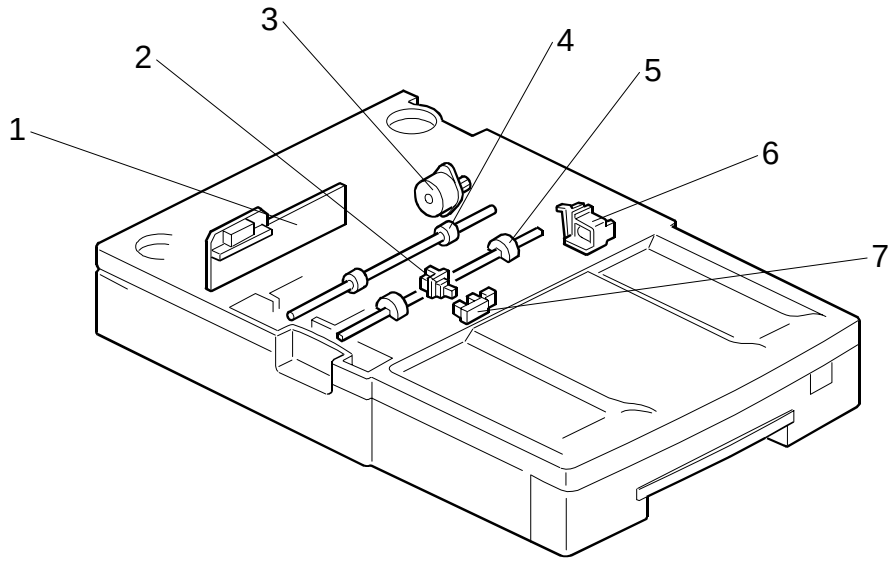
PAPER FEED UNIT
(Machine Code: G512)

1. OVERALL INFORMATION

1.1 SPECIFICATIONS

Paper Size:	A4, 8½" x 11"
Capacity:	250 sheets (Plain paper)
Size (W x D x H):	332 mm x 523 mm x 79 mm (13.1" x 20.6" x 3.1")
Weight:	2.8 kg [6.2 lb.]

1.2 COMPONENT LAYOUT



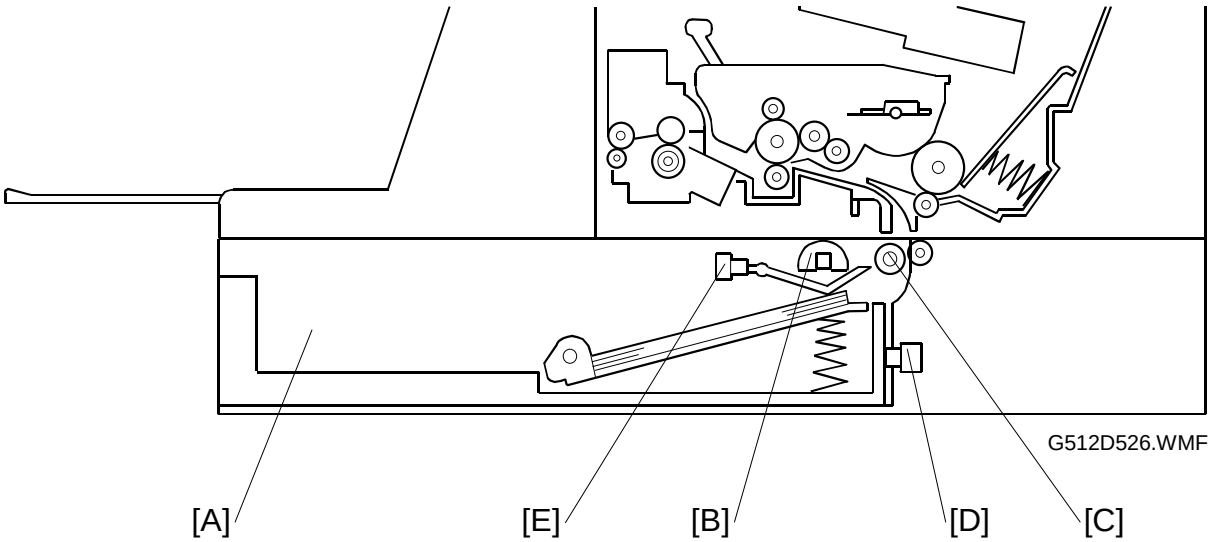
G512V504.WMF

No.	Name	Description
1	Paper Feed Unit Control Board	This board receives power and control signals from the mechanical control board. This board drives the motor and solenoid in the optional paper feed unit.
2	Paper Tray Sensor	This detects whether the lower paper tray is set correctly.
3	Paper Feed Motor	This motor drives the paper pick-up roller and paper feed roller.
4	Paper Feed Roller	This feeds paper from the lower paper tray into the machine.
5	Paper Pick-up Roller	This picks up the top sheet of paper from the stack in the lower paper tray and feeds it to the paper feed roller.
6	Paper Feed Solenoid	This controls the paper feed clutch.
7	Paper End Sensor	This detects when paper in the optional paper feed unit has run out.

2. DETAILED SECTION DESCRIPTIONS

2.1.1 OPTIONAL PAPER FEED UNIT

Overview

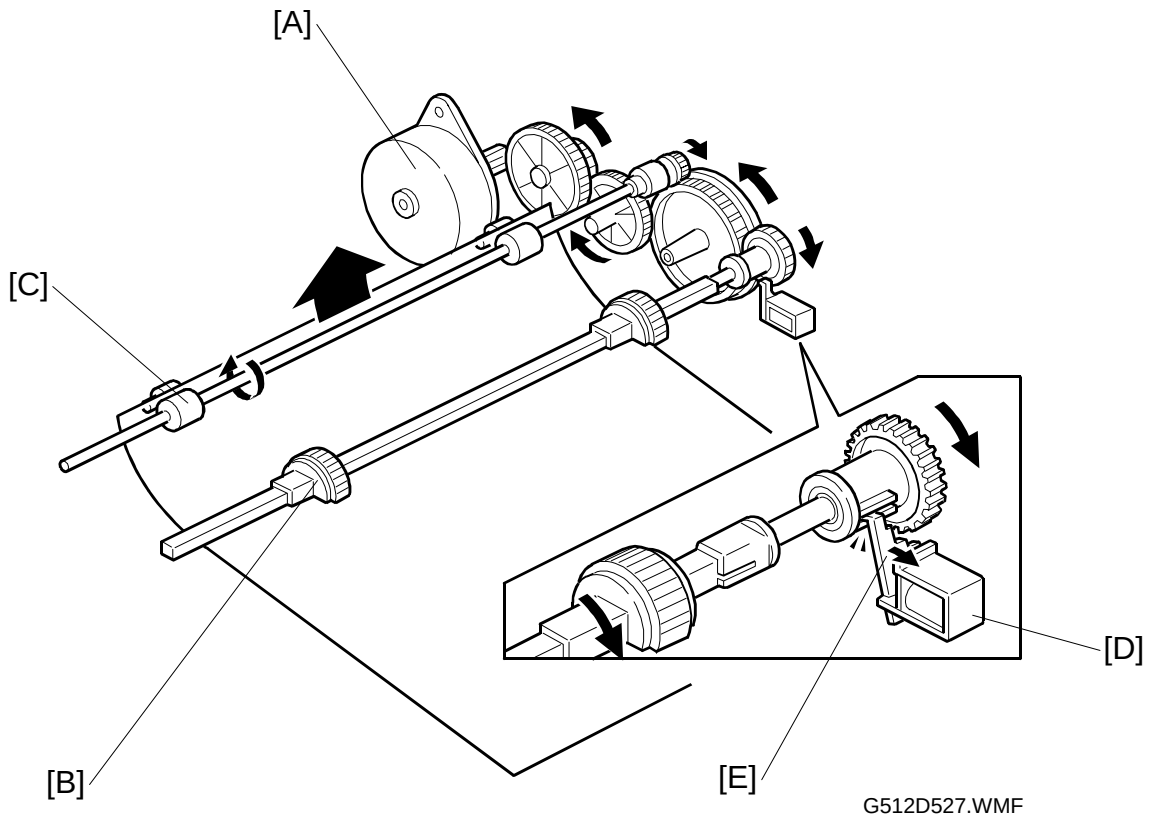


An optional paper feed unit [A], which holds 250 sheets can be installed in the machine.

The optional paper feed unit uses two semicircular pick-up rollers [B] and two corner separators. The semicircular pick-up rollers make one rotation to drive the top sheet of the paper stack to the feed rollers [C]. Two corner separators allow only one sheet to feed. They also serve to hold the paper stack.

The lower paper tray sensor [D] detects when the lower paper tray is closed. The paper end sensor [E] detects when paper runs out.

Paper Feed Mechanism



The paper feed motor [A] drives the pick-up rollers [B] and feed rollers [C].

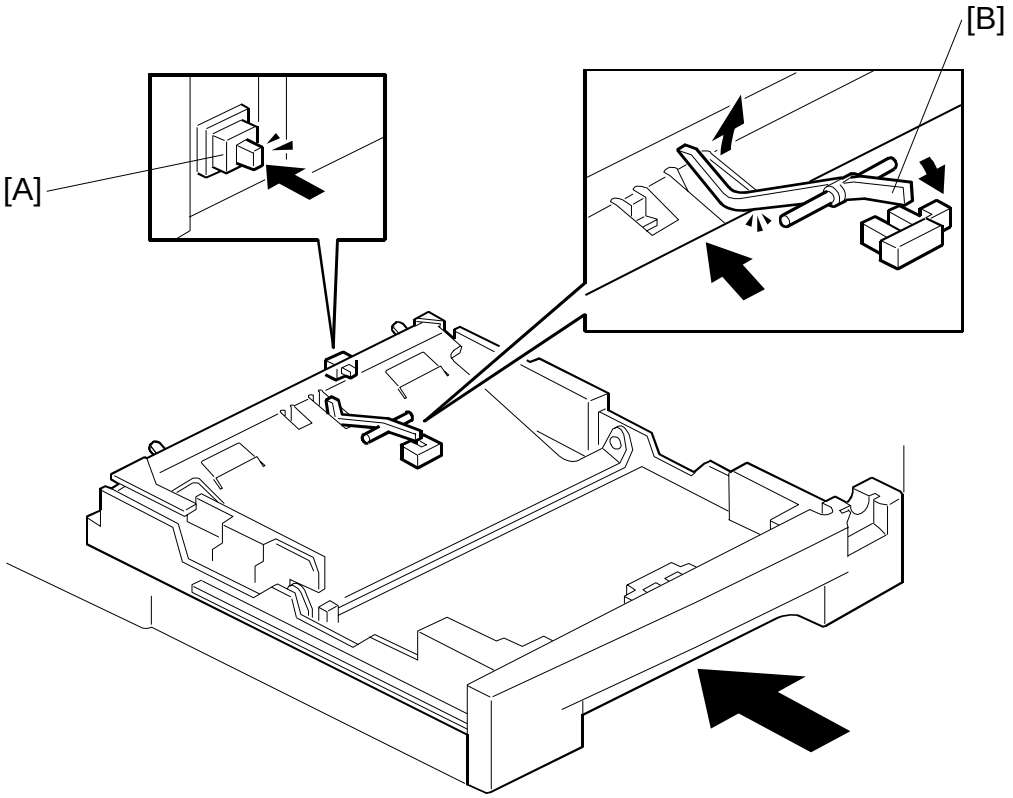
When the machine feeds a sheet of paper from the optional paper feed unit, the solenoid [D] of the paper feed clutch is energized to release the stopper [E], and the rotation of the paper feed motor is transmitted to the pick-up roller shaft. The solenoid stays on for 300 milliseconds and then turns off. The pick-up rollers stops after one rotation.

Before the pick-up rollers stop, the feed rollers catch the leading edge of the paper and continue feeding it.

Optional Paper Feed Unit Detection

When the machine is turned on or the printer is reset, the machine monitors if the optional paper feed unit is installed. The machine cannot detect the optional paper feed unit if it is installed while the power is on.

Paper Tray, Paper Size and Paper End Detection



G512D528.WMF

When the lower paper tray is closed, the edge of the tray turns on the paper tray sensor [A] located on the paper feed unit and the machine detects that the paper tray is closed.

When the optional paper feed unit runs out of paper, the paper end sensor actuator [B] drops through a slot in the bottom plate and the machine detects that paper has run out.

There are no sensors to detect the paper size in the machine. The user can change the paper sizes to A4 or 8½" x 11".

Paper Feed Selection

If there is an optional paper feed unit installed in the machine, the selection for feeding paper is decided in accordance with the current setting.

Jam Detection

The machine detects the paper jam at the optional paper feed unit if the registration sensor does not turn on within 7 seconds after the solenoid turns on (Error Code 50).

3. INSTALLATION

Refer to the Operator's Manual for how to install and set up the lower paper feed unit.

4. REPLACEMENT AND ADJUSTMENT

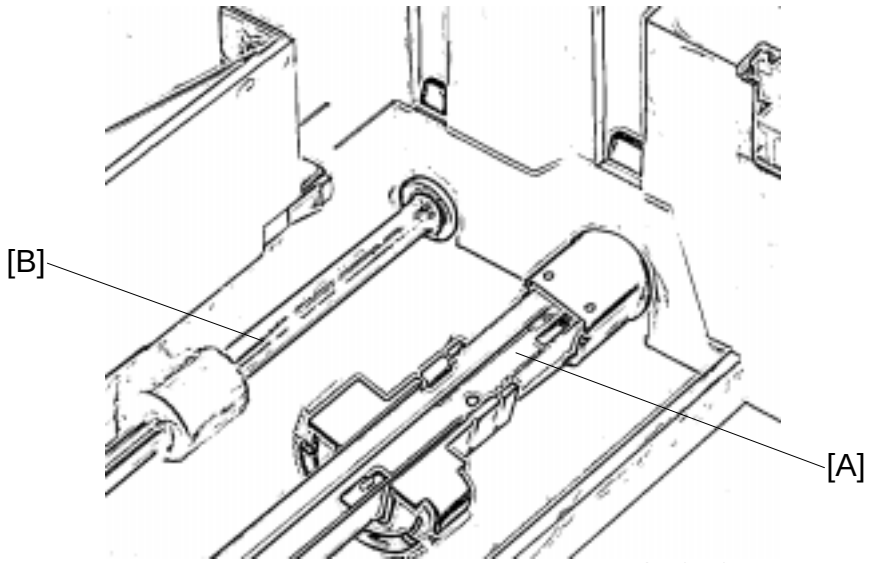
4.1.1 PAPER FEED TRAY MOTOR AND SOLENOID REMOVAL

Preparation

1) Remove the lower tray.
2) Turn the optional paper feed unit upside down.

A: Paper pick-up roller assembly (2 bushing hooks)

B: Paper feed roller assembly (3 hooks)



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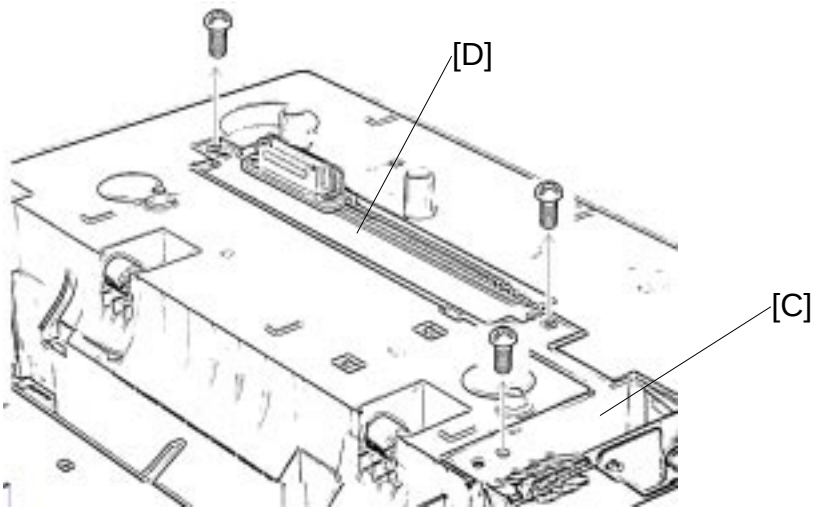
Turn over the optional paper feed unit.

C: Grounding plate (2 tapping screws)

D: Control board (1 tapping screw)



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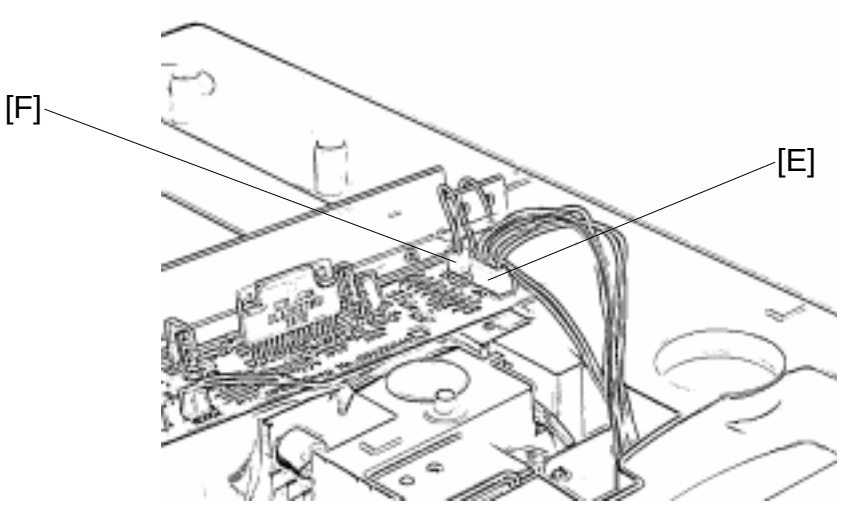
E: Paper feed tray motor connector (CN2)

F: Paper feed tray solenoid connector (CN3)



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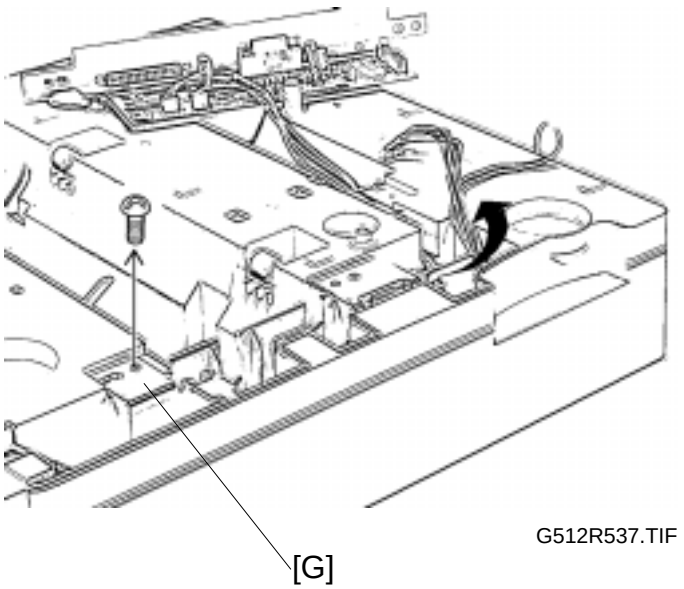
G: Drive unit (1 tapping screw)



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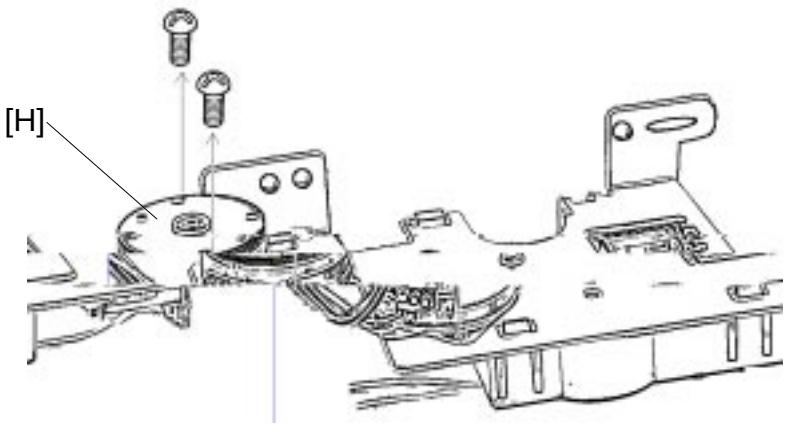
H: Feed motor (2 Philips screws)



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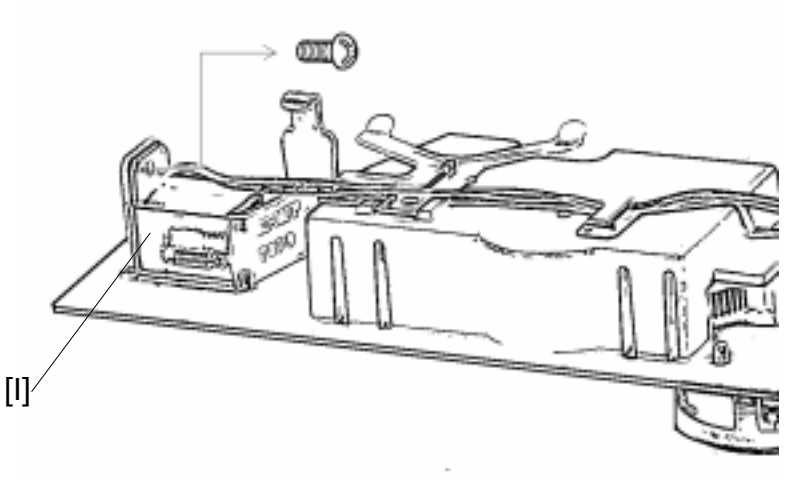
I: Paper feed tray solenoid (1 Philips screw)



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Reinstallation

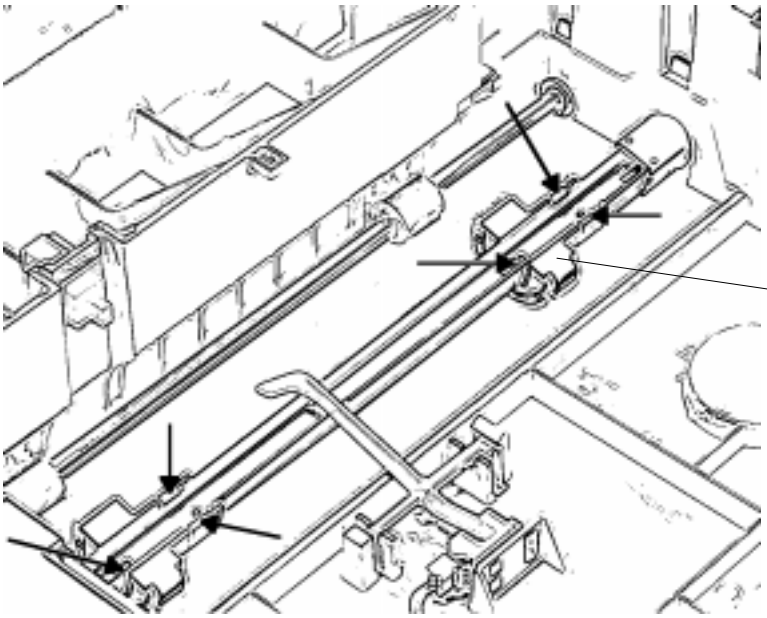
Make sure the drive unit does not pinch the harness.

4.1.2 PAPER PICK-UP ROLLER REMOVAL

Preparation

1) Remove the lower tray.
2) Turn the optional paper feed unit upside down.

A: Paper pick-up roller (3 hooks)



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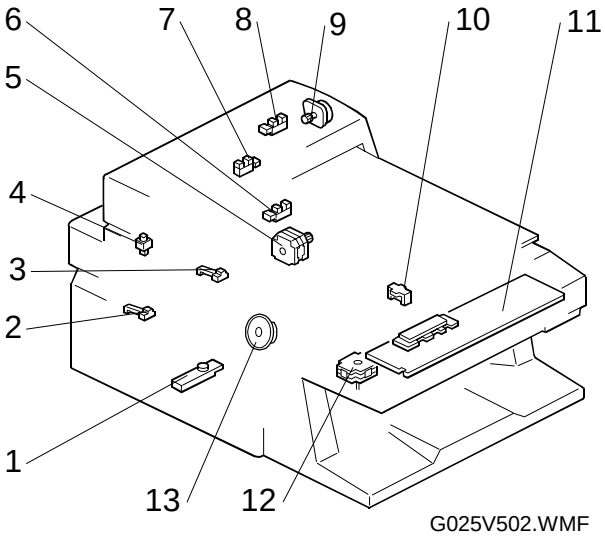
ELECTRICAL COMPONENTS LAYOUT

G027 model



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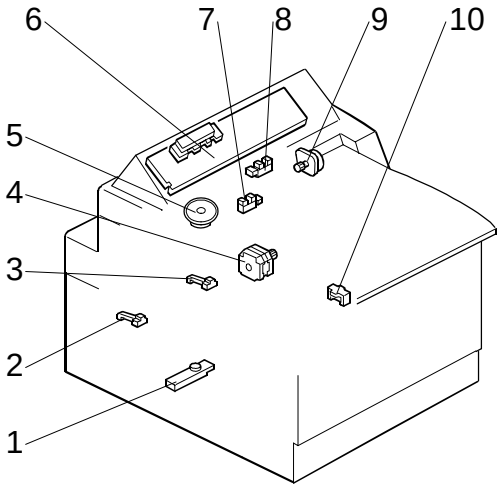
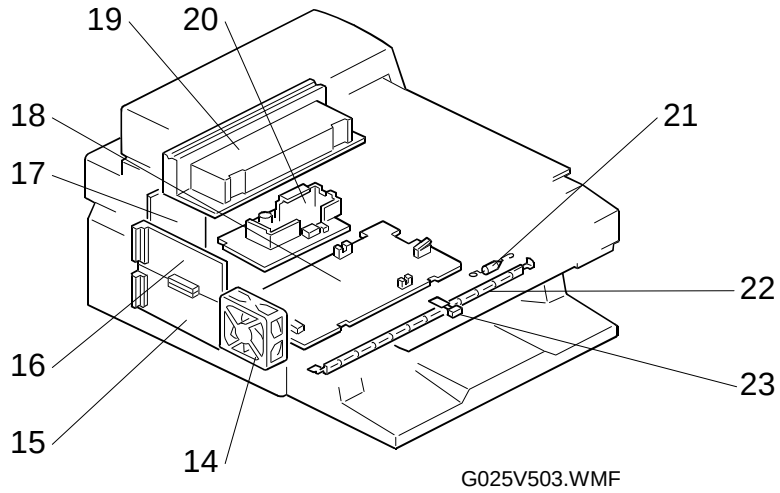
G025 model



G025ELECOM1.WMF

G027	G025	Description		P-to-P Location
Sensors				
1	1	Toner End Sensor	(S1)	C7
2	2	Paper Width Sensor	(S2)	C7
3	3	Paper End Sensor	(S3)	C7
6	5	Home Position Sensor	(S4)	O7
7	7	Document Sensor (G036 only)	(S5)	O8
8	8	ADF Registration Sensor (G036 only)	(S6)	O8
Motors				
5	4	Main Motor	(M1)	C4
9	9	ADF Motor (G036 only)	(M2)	O6
12	-	Scanner Motor	(M3)	O7
14	14	Fan Motor	(M4)	C4
Switch				
4	-	Platen Cover Switch (G036 only)	(SW1)	O9
Solenoid				
10	10	Paper Pick-up Solenoid	(SOL1)	C8
PCBs				
11	6	Operation Panel	(PCB1)	O2
15	15	Control Board	(PCB2)	I4
16	16	Scanner Control Board (SCB)	(PCB3)	L5
17	17	Network Control Board (NCU)	(PCB4)	I9
18	18	Mechanical Control Board (MCB)	(PCB5)	F5
20	20	Power Supply Unit (PSU)	(PCB6)	D9
Others				
13	5	Monitor Speaker	(SP1)	H6
19	19	CCD Unit	(CCD1)	O6
21	21	Thermofuse	(TF1)	B9
22	22	Fusing Lamp	(L1)	B9
23	23	Thermistor	(TH1)	C8

G027 model (G025 model parts are in the same location as G027 model)



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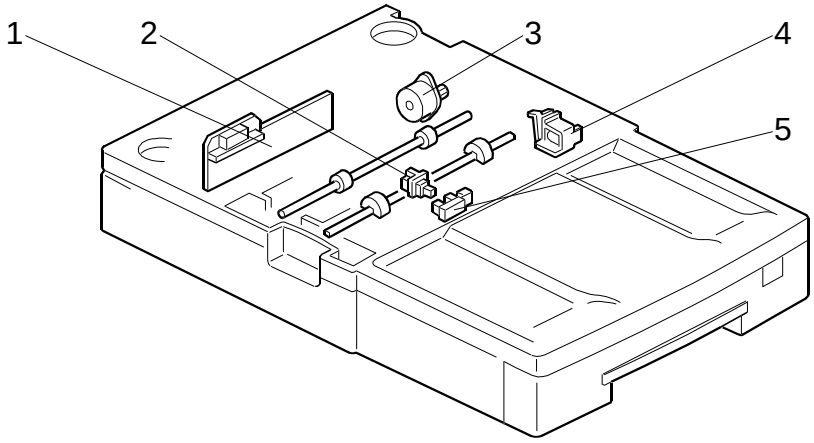
OPTIONAL PAPER FEED UNIT



G025V504.WMF

No.	Description		P-to-P Location
1	Paper Feed Unit Control Board	PCB1	C2
2	Paper Tray Sensor	S1	B2
3	Paper Feed Motor	M1	B1
4	Paper Feed Solenoid	SOL1	B2
5	Paper End Sensor	S2	B3

G025/G027 POINT-TO-POINT DIAGRAM

May 14, 1999